Xperience and Xplore

Technical Service Manual

Introduction:

Please read the instructions in this service manual before attempting to troubleshoot or repair this product for the first time. If there is anything that is not clear or if you require additional technical assistance, contact Sunrise Tech Service at 1-888-703-9021. At the prompt, you will be asked to either dial an extension or hit “0” for the operator – dial either extension 8183736 or 8182107 – for immediate assistance please dial “0” for paging and operator.

Safely troubleshooting and/or repair of this product depends on your diligence to following the instructions within this manual. Sunrise Medical is not responsible for injuries or damage resulting from a person’s failure to exercise good judgement an/or common sense.

This Service Manual has been compiled as a troubleshooting guide for the Quickie Xperience and Xplore.
This Service Manual is intended for use by persons with a basic working knowledge and the skills required in servicing and maintaining Power Wheelchairs. Persons without a General Working knowledge and expertise in servicing of this product should not carry out troubleshooting procedures. This can result in future servicing, and/or damage to the unit.

Note: *Photographs, Parts and content may differ from the actual products in some cases due to changes in specifications and other factors.*

Tools Needed

The following list of tools should enable any task to be dealt with. Some will only occasionally be needed, by it is advisable to own or have access to them.

1. Metric Socket Set
2. SAE Socket Set
3. Hexagon Open End Wrenches (SAE & Metric)
4. 3.5 – 8 mm flat screwdriver
5. Number 0 – 2 Phillips or cross-head screwdriver
6. Vise Grips
7. Adjustable Pliers
8. Cir-clip Pliers
9. Hammer (Small & Large)
10. Soft Hammer (Rubber and/or Plastic)
11. Q-Tronix Programmer
12. R-Net In-line Programmer
13. Wire Strippers
14. Shraeder Valve
15. Ty-wraps short – medium - long

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8. Specialty Controls and Setup

9. Diagnostics - section dedicated to every aspect of chair.

10. Acronym – Section

Section 1 - Batteries

Description:
The batteries are used to power the chair and need to be maintained to have full potential and use of product. Please use specified batteries and follow all charging recommendations. Please use charger provided by manufacturer – neglect of this will void warranties.

Safety
If mishandled batteries can be dangerous and hazardous.

1. All mobility batteries whether Gel or Sealed type, contain lead and sulfuric acid. Both of these materials are toxic and in the case of sulfuric acid, highly

corrosive. Additionally, when batteries are charged, they produce hydrogen gas which is “highly”

flammable and can cause a possible explosion. This is why proper handling is mandatory at all times.

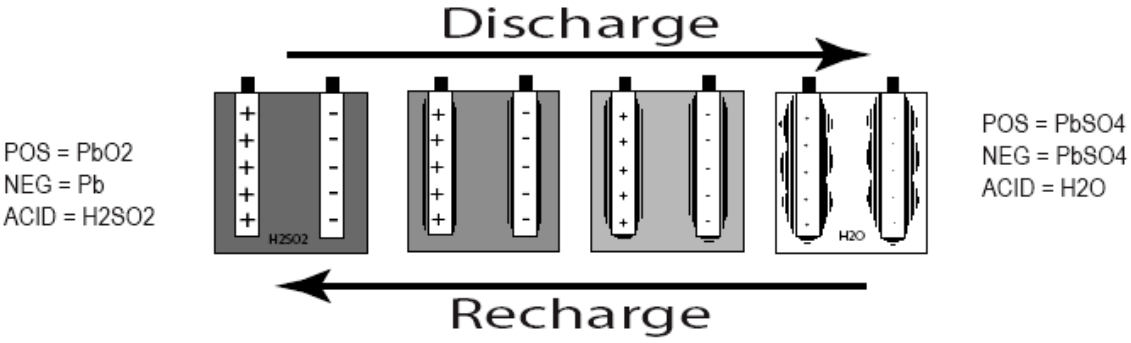
2. Battery explosion - this is the result of too low an acid/electrolyte level in the battery, which allows high concentrations of hydrogen to built up. This is possible with all batteries if improper charging or battery failure occurs. But not common in gel/sealed batteries.

3. Keep sparks and flames away from batteries

4. Burns – dropping a wrench or screwdriver across battery terminals results in sparks and arcing and intense heat. Improper wiring and assembly may short the battery the wiring and produce an electrical fire.

5. Pollution – Batteries should be disposed at a reliable battery recycler. Improper disposal of batteries damage the environment.

Battery Charger Cycle Illustration
Typical flooded battery

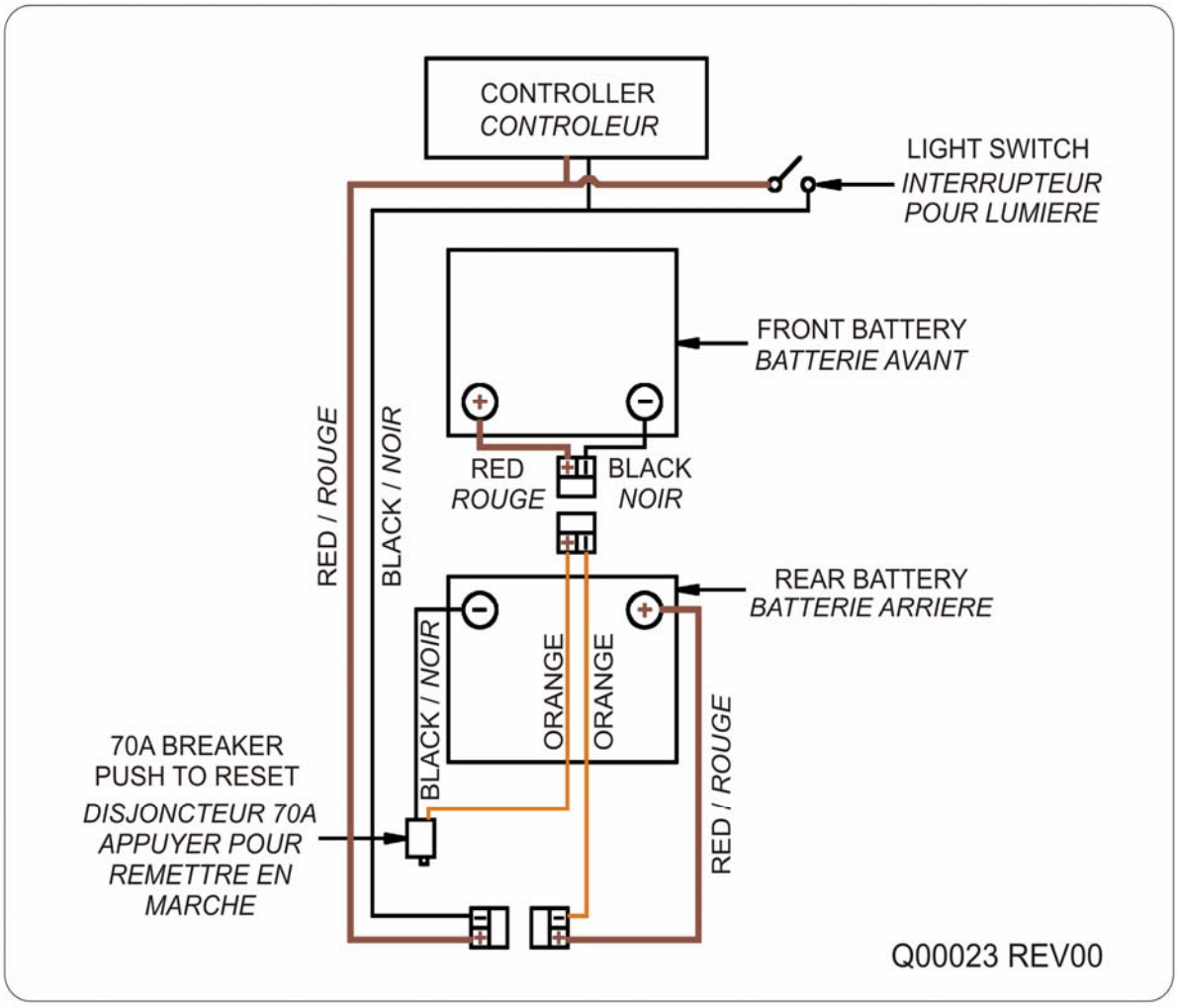


As battery discharges, the sulfate from the electrolyte forms on the plates. As battery recharges, the sulfate is driven back into the electrolyte.

22NF Battery

GRP 24 Battery

Wiring Diagram for Batteries



Note: The orange wires have recently been changed to White and Black.

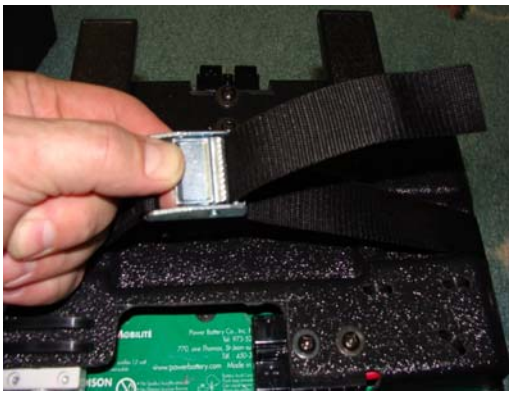
Installation & Wiring

1. Make sure you installed the Red Wire to the Positive Post and the Black wire to the negative post. The Back battery cover has the 70 amp Circuit breaker included – strapped in by 2 ty-wraps and breaker with knurled nut as seen in photos below.

(Rear battery)

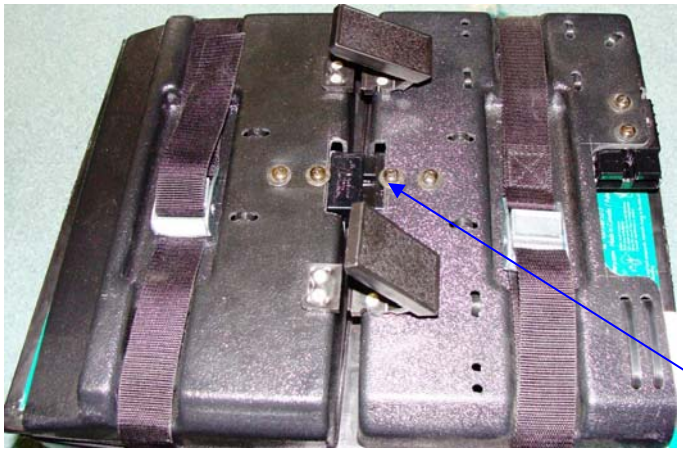
(Front battery)

2. Check to insure the strap is fastened tightly around case
As shown in photos below:

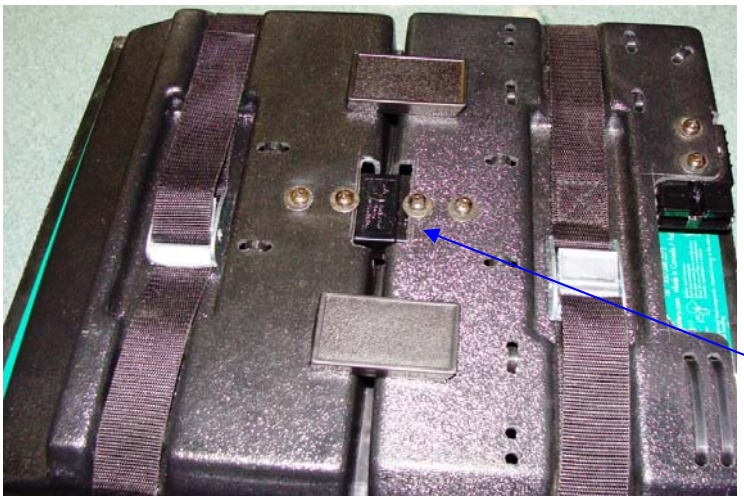


Depressing Metal allows you to pull tighter on strapping

3. Check to make sure connector locks and plastic clips are
Engaged which ensures connector is locked see photos
Below:



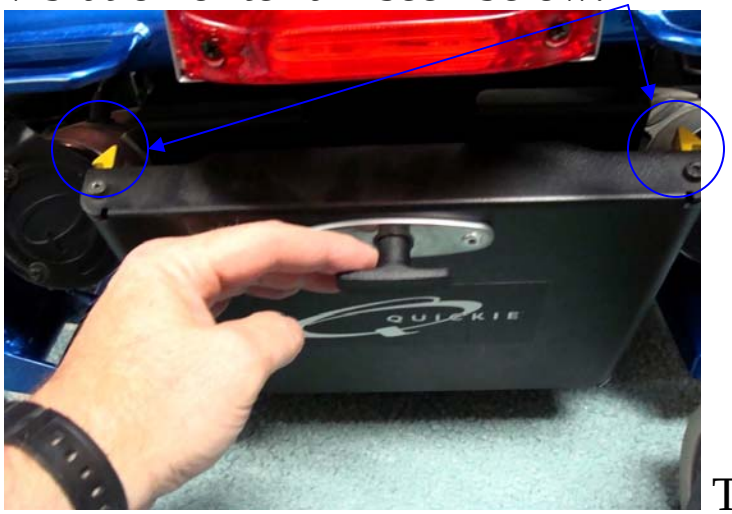
Connector not locked fully



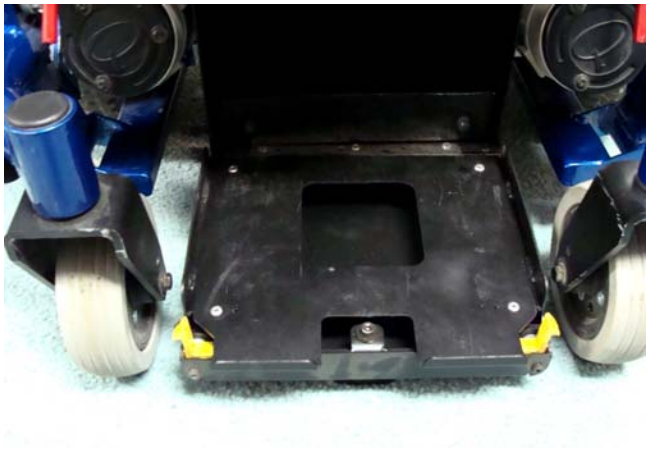
Fully Locked

4. Batteries use a slide out battery tray and operation to open is done by positive forward pressure on the back and pulling of handle at same time shown below:

This allows release through 2 different tabs which secure it from releasing through heavy vibration or terrain seen below:



This pulls enough for Easy release of back and battery access Yellow Tabs for good visual

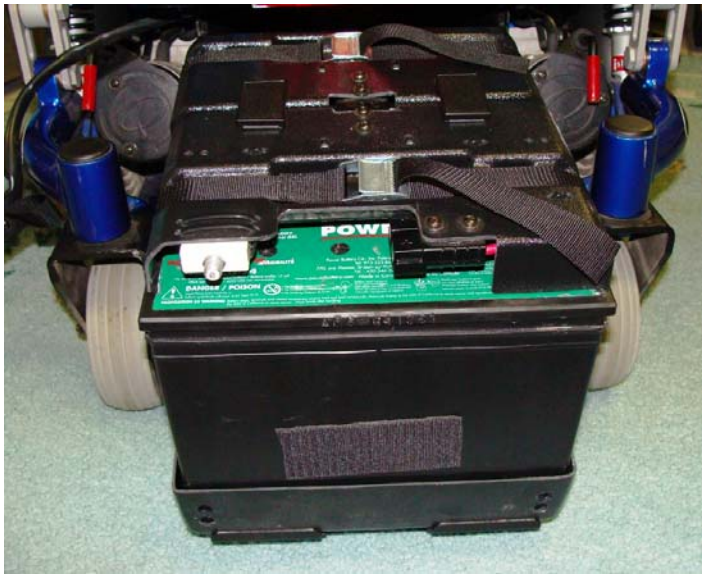


The battery slide out tray is shown in the picture below:

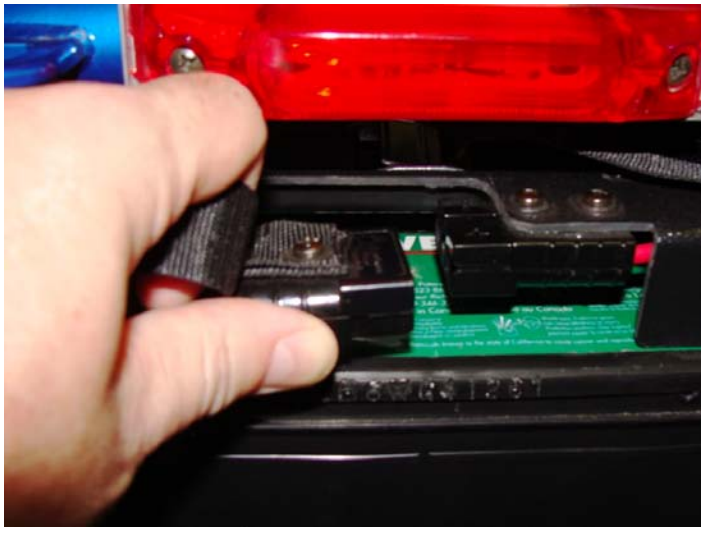
The battery holder itself has a rubber bumper and vent holes:

(Note: Rubbers to the back – prevents binding)

Photo below shows batteries on sliding tray



5. Once batteries are installed and box is slid all the way in the main power connector is connected for power to the system show in picture below:



There is a finger holder on plug to help match and make sure you don't try to plug the opposite way. Below shows connections:

Group 24

22 NF

Troubleshooting Batteries

1. Check for good voltage at Module input charger port. Should read between 23.5 and 25.8 volts for proper operation. Less than 23.5 volts will give a low battery Indicator (2 Bar flash).
2. If no voltage at port go to cable that inputs voltage to Control found on battery box connector shown earlier. Once again verify voltage and check for popped circuit Breaker. Reset Circuit breaker.
3. If still no power go directly to individual batteries across + and – posts to see at least 12.2 to 13 volts (fully charged).
4. The 3 tests above will verify voltage in what is known as an unloaded state. The next test is to insure batteries last under load. This can be done a number of ways. 2 ways of checking are listed below:
   a) The load test across the + and – terminals of battery - make sure battery is in full charged state. Hook up load tester and draw 100 amp load across for 10 seconds.
   b) The chair has a free wheel release where the motor and gearbox can be run un-loaded – this still draws 3 -4 amps across the load. Hold joystick or input device for 1 minute If after release in a minutes time it drops more than a volt Change batteries – if it drops between .6 and 1 volt it has a Cell that is weak and batteries will no stay fully charged It is recommended to change batteries. If the voltage after a minutes time drop less that .1 volt but not greater than 0.5 volts the batteries are in good shape.

Code 2C00 – indicates Low Battery - 1 Bar Flashing

Chargers

Introduction: The battery charger is another essential part of the Power Chair for the batteries need to be fully charged daily for heavy users. It is strongly recommended of any technician to make sure they have a spare charger that is working well and/or a good set of batteries.

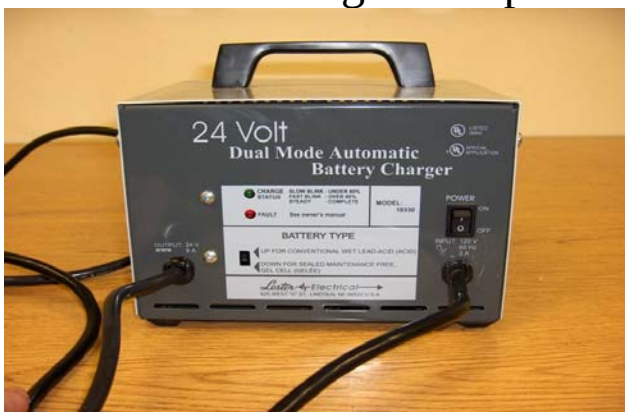
1. Lester Off-Board 8 amp Charger - The Lester Off Board charger part number BATC8LS – is a Transformer Driven 8 amp charger that has been working in this industry for over 17 years. It have an easy to operate switch that turns on the charger and has 2 LED's to indicate charge rate and faults.

The chargers operation is when AC and DC voltage are available (Note: 18 volts minimum DC) the Green Light flashes to indicate charge rate. A slow flash indicates the batteries need a charge and it is output 8 amps as the charging continues when the voltage approaches the bulk charge rate it starts flashing the Green LED rapidly indicating 2 amp rate until is sees a change of less than 500 mV and then turns Solid Green to indicate full charge cycle.

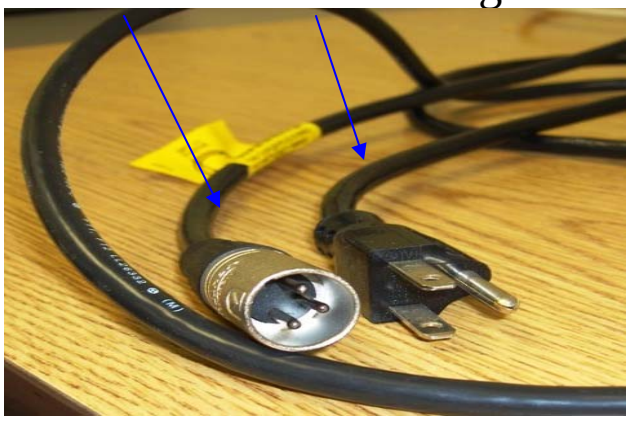
The table below depicts operation of Green and Red LED operation and fault modes.

Red Light	Green Light	Function
Off	Off	No AC power or no battery connected
Steady	Steady	Light test when AC connected
Off	Slow Blink	Charging (< 80% charged)
Off	Fast Blink	Charging (> 80% charged)
Off	Steady	Normal charge completed
Steady	Off	Undervoltage shut off, < 18.0 volts
Slow Blink	Off	Overvoltage shutoff, > 33.96 volts
Fast Blink	Off	Max timer shutoff, > 16 hours

The 24 Volt Charger is depicted below:



The D.C. and A.C. wiring are shown below:



The 3 Connection Points are Shown Below from the DC Connector:

Pin 1 +

Pin 2 –

Pin 3 Inhibit

2. Troubleshooting Chargers - When troubleshooting electronic equipment there is equipment necessary for checking and evaluation. The very first is a Multi-meter used for checking Resistance (continuity) – AC voltage from the Wall Plug – D.C. voltage from the batteries and Current the flow of the charger. The second is a load tester needed to evaluate (normally at 100 amps for 10 seconds) the batteries capacity to hold a charge rate.

The other two items recommended but not a necessity is a good set of batteries and/ or another known good charger.

<u>Troubleshooting Tips</u>

1. Check for battery voltage and polarity at chair's charger input.
   The voltage needs to be at least 18 volts for the charger to turn on.
2. Check for continuity between cable (DC output and inside) this is performed with a Multimeter
   on the setting of resistance and with each of the connector points test the wiring from one end to the other which is inside the charger plug and charger.
3. Check for A.C. voltage. The wall outlet in North America should give a reading between 110 and 120 volts A.C.

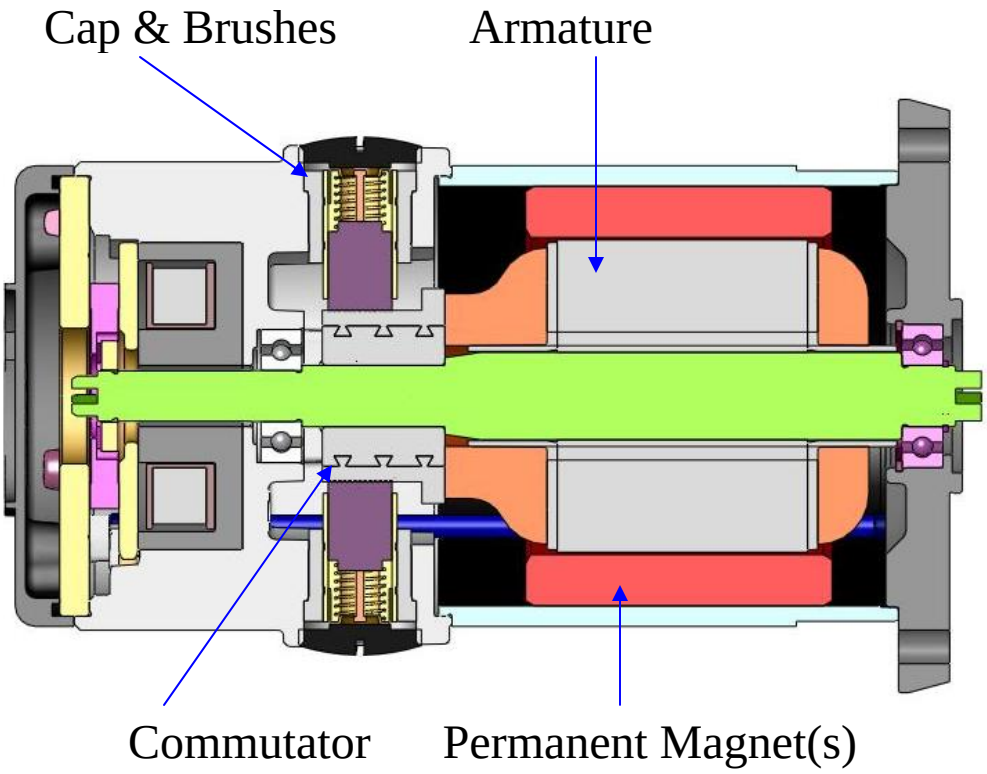
4. Check for possible blown fuse. As a protection to the charger and chair components this fuse will go if it attains close to 15 amps of current - it will not operate charging of chair until replaced.

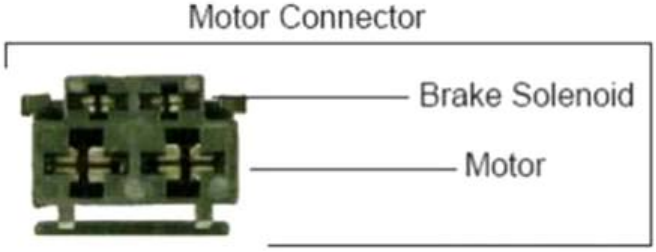
Code 1E03 – Charging chair Scroll repeat on Display

Motors

Intro: The motor is an essential part of any Power Chair and needs to be looked at annually or when an error occurs which point to one of 3 parts that make up Motor Assemblies. The motor assembly consists of the motor – brake – and gearbox.

The Xperience and Xplore both use the same style motor and there are 2 varieties of motors to choose from. The next section shows parts of the Motor – Removal – and Diagnostics for trouble-shooting the motor.



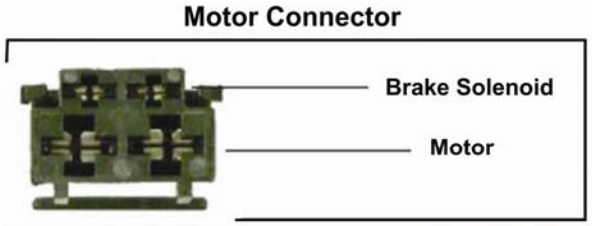


	Resistance Value
Brake Solenoid	15 – 16 ohms
Motor	0 – 2 ohms

Motor Resistance & Meter Check for Xperience & Xplore

Checking Motor Resistance and Continuity

Chair	Motor Resistance	Brake Solenoid Resistance
Xplore	0-2 ohms	15 -16 ohms
Xperience	0-2 ohms	15 -16 ohms



Motor Assembly - Removal

Xperience

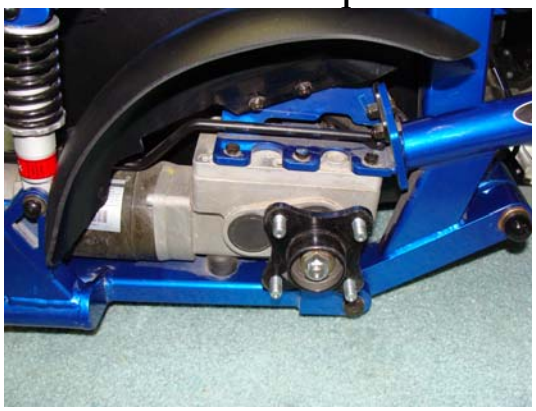
1. Take the 4 - 5/8” bolts from the Wheel Assembly shown in photo below:

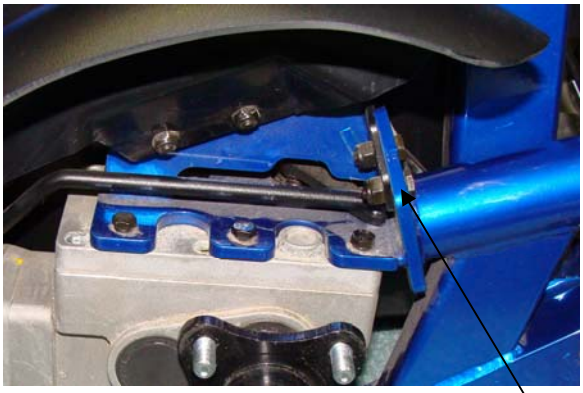
2. Remove connector from motor control - access through front of chair box shown below:

Note: no tools necessary for step above

Shows access and removal of connector for ease of removal – disconnect yellow communication connector as well

3. Remove shroud and release assembly - 10 mm and Phillips screwdriver required as well as pliers and 7/16” wrench





Remove shroud bracket assembly using a 7/16” open end and ratchet.

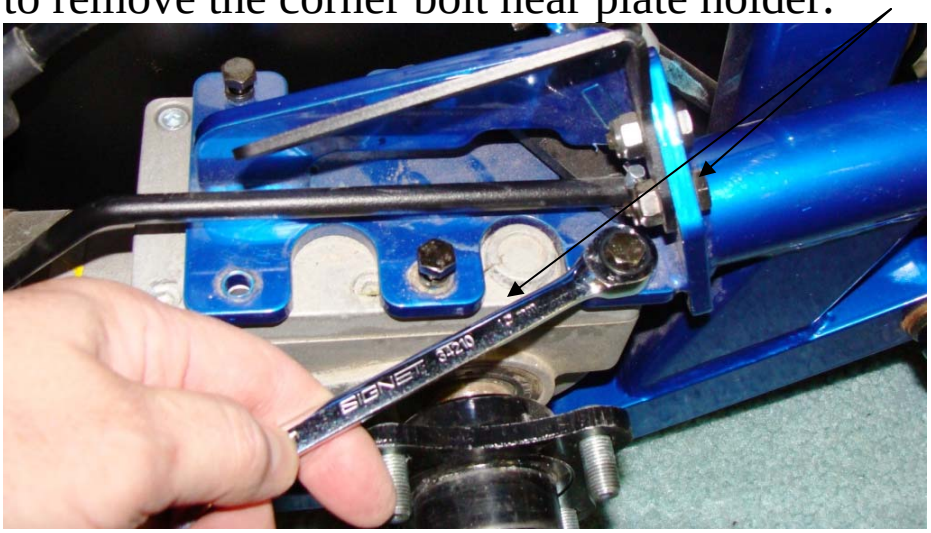
4. Remove cotter pin using long nose pliers to firmly remove

5. Disassemble the release mechanism further using a Phillips screwdriver to remove 3 screws holding attaching plate

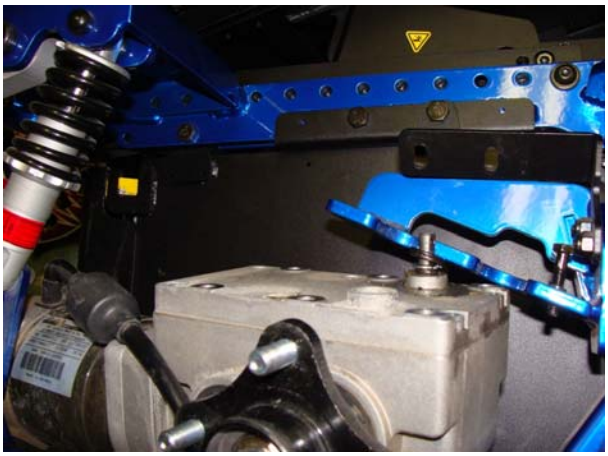
Note: Pictures below show parts after removal and removal of Plastic restraining clip. This step is necessary for both motor and motor assembly removal.

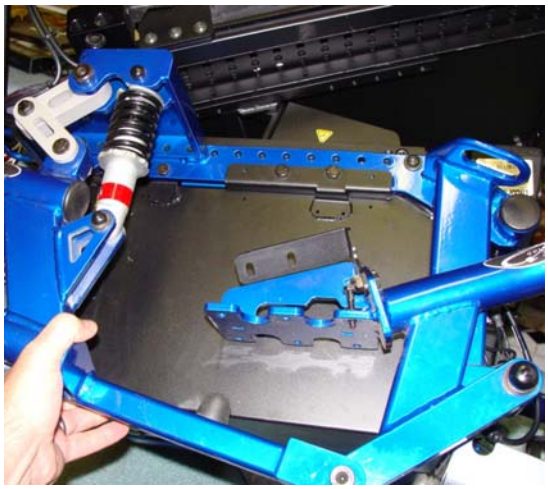
6. Next step in removing complete assembly is to remove with a ratchet or open wrench the quantity 5 - 10mm head bolts. Note*: remove rubber stopper prior to removing back bolt*

If the plate is not removed you will need an open end wrench to remove the corner bolt near plate holder.



7. Finally to remove complete Gearbox and Motor the Chair needs to be moved on its side as shown.



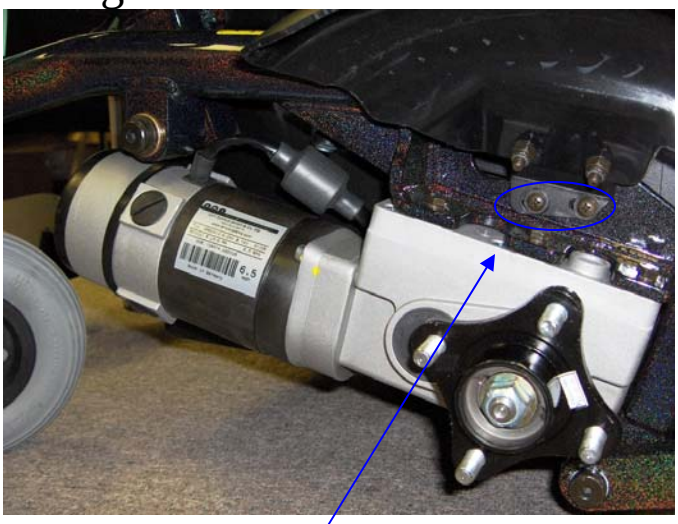


This allows to move frame downward to remove assembly

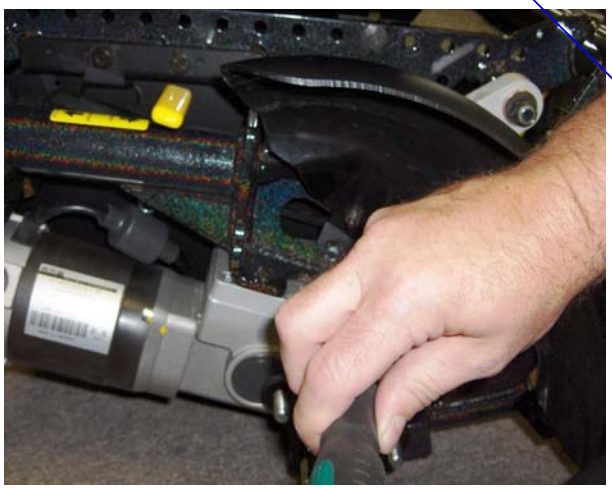
Xplore Motor Assembly - removal

1. Follow details found on page 17 - removal of Drive Wheel and removal of motor connector from control.

2. This gives access to the motor and shroud assembly

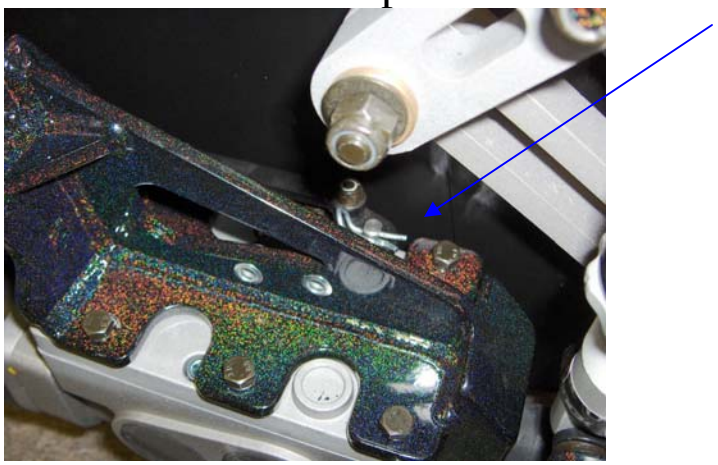


Remove the 2 Phillips Screw with No. 2 Phillips Screwdriver



3. You now have access to the Motor Gearbox 5 - 10 millimeter head bolts – remove cotter pin first prior to the bolts with a pair of Long Nose pliers as mentioned on page 18 of manual

Place where Cotter pin should be removed



Removal of 5 bolts using ratchet with 10 mm socket

Unlike the Xperience the **Xplorer Motor** assembly can be removed if the bolts and cotter pin are removed no need to lay chair on its side.

<u>Motor only</u> on both chairs:

To remove only the motor a 3/16" allen key socket is needed and then remove the cotter pin from the holder on the frame as well as removing connector from control.

Troubleshooting Motors

1. Testing the motors you will have various means to do this by. The first way is if the motor has shut down and this is verifying what *Diagnostic Code* you have there are 2 main codes for left and right motor and 2 main codes for the brake and solenoid. They are as follows:

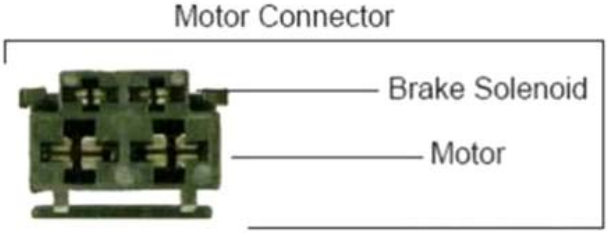
   3B00 – for the M1 connection open – control does not see proper connection or resistance to **Motor 1**. Left Code for rear wheel drive units and right code(3C00) for Mid- wheel drive. *(This is in reference to the Motor mounted on the left)*

   3C00 – for the M2 connection open – control does not see proper connection or resistance to **Motor 2**. Right Code for rear wheel drive units and left code(3B00) for Mid- wheel drive. *(This is in reference to the Motor mounted on the right)*

   1505- for the Right Brake open – control does not see good Brake resistance – two cases: normally open – close to 0 ohms or shorted - ultra high resistance.

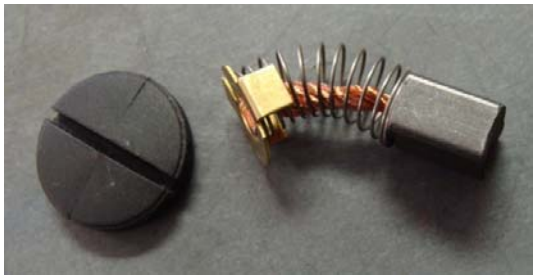
   1506 - for the Left Brake open – control does not see good Brake resistance – two cases: normally open – close to 0 ohms or shorted - ultra high resistance.

2. The check is very simple as shown on page 16 - check the the small connector brake and large connector for motor.

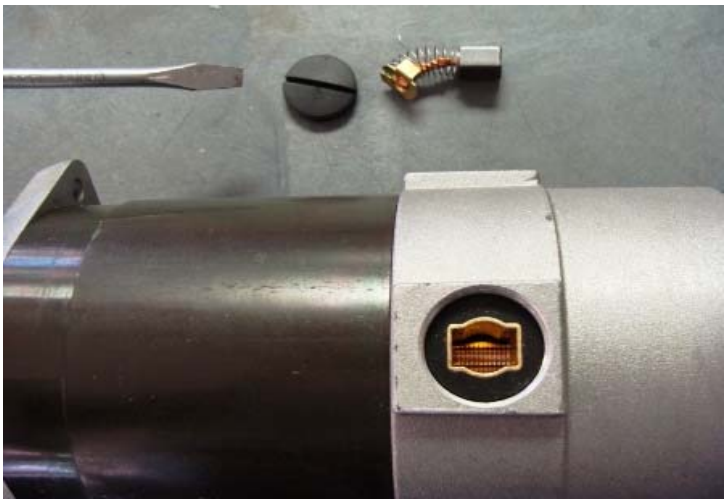


15 – 16 ohms
0 – 2 ohms

3. The Motor may have a high resistance reading and this could be due to one or two or more brushes that are damaged.
   To extract, use a Large Straight edge screwdriver that matches to the brush holder. This eliminates stripping and basically ruining the entry of the brush housing.
   Once extracted check the brush for spring wear and length of Carbon material – it should be no shorter than 1//2 inch in length and brushes should be wearing smoothly on Commutator.

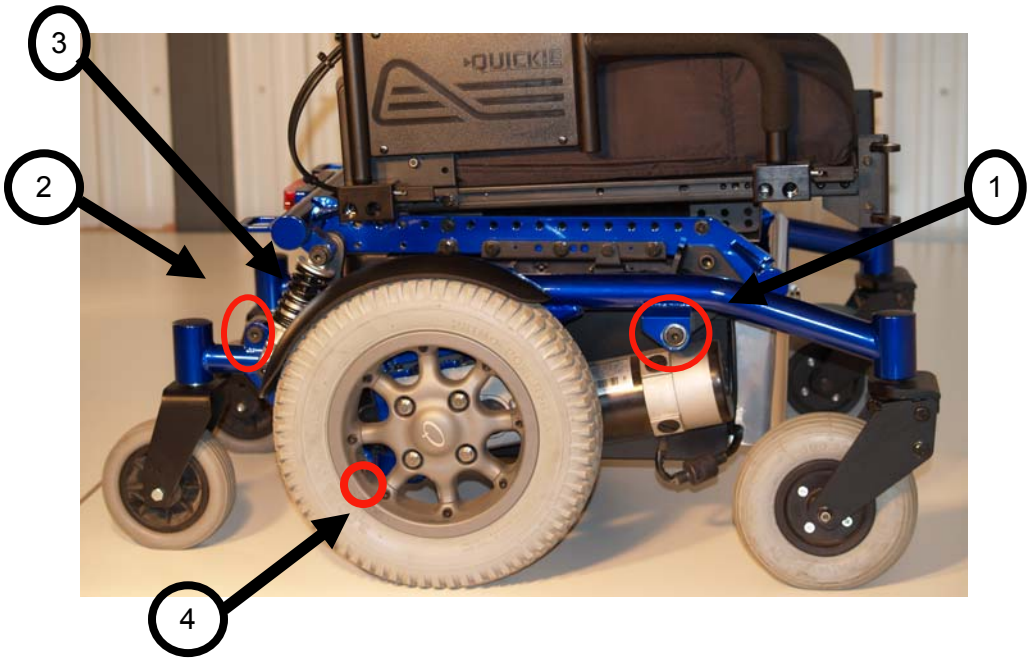


Brush & Cap Set - 4 Brushes & Caps – Part # 014819



Suspension

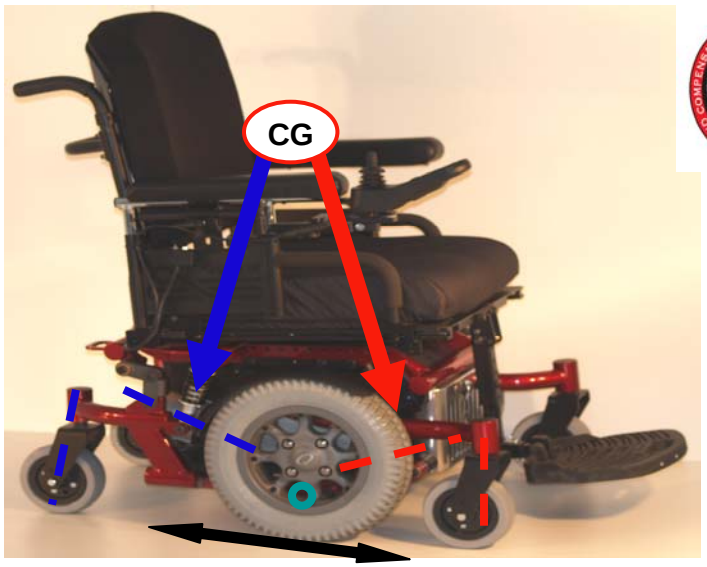
- Innovative Drive system
  - Front swing arm (1)
  - Rear floating arm (2)
  - Shock absorber (3)
  - 4 pivot points connecting all components together
- Ground compensation
- Gravity compensation
- Gravity control

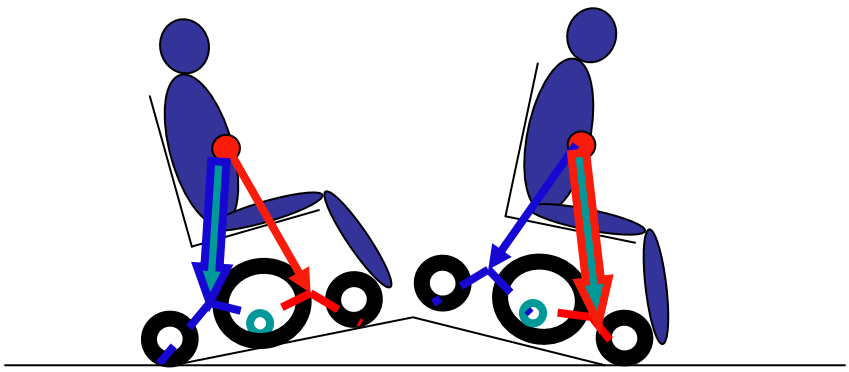


Gravity Compensation

Sunrise's MWD design solution: "interactive suspension"

- The **connected front and rear arms** create a wide footprint that joins front and rear casters to the drive wheels
- Always redistributes the load over drive wheels and casters





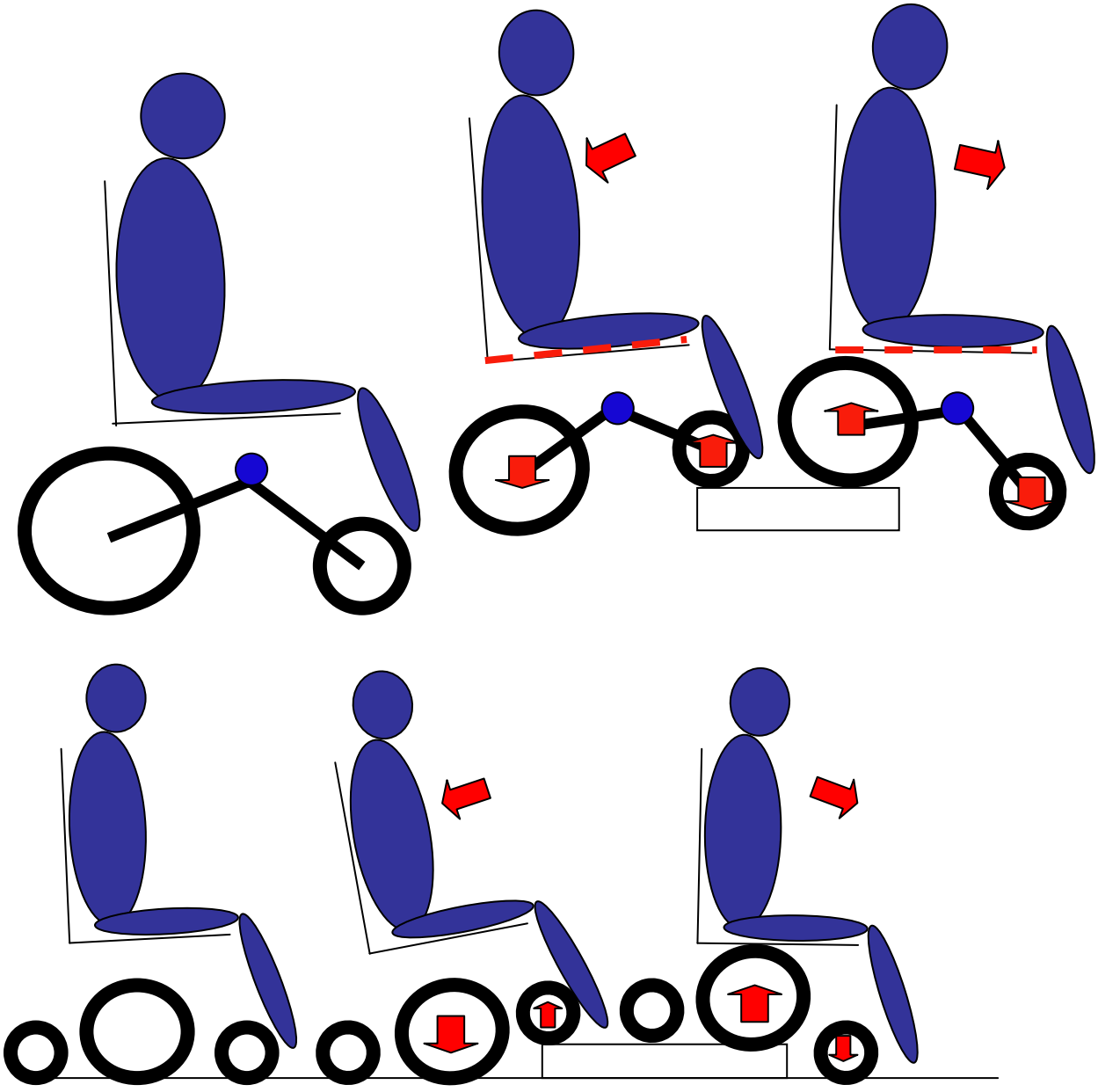
Interactive suspension:

- Adjustment free
  - The performance of the system is based on the geometry of the pivot points and the links

Ground Compensation

Movement of the front swing relative to the base frame

- Reduces posterior projection
- Reduces anterior projection
- The seat remains closer to it’s neutral position going over an obstacle.

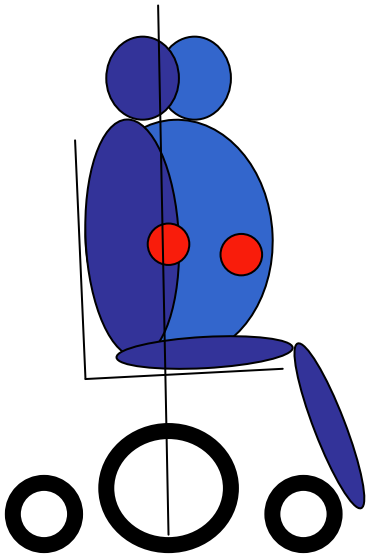


Note: Same on Xperience

Gravity control

Load distribution over casters and drive wheels depends on:

- User's body type
  - Ectomorph
  - Mesomorph
  - Endomorph
- Seating system
  - Thickness of the back
- Static position
  - Static tilt
  - Back angle
- Dynamic positioning
  - Usage of a power tilt and/or recline system
- Options
  - Vent tray
  - Back pack

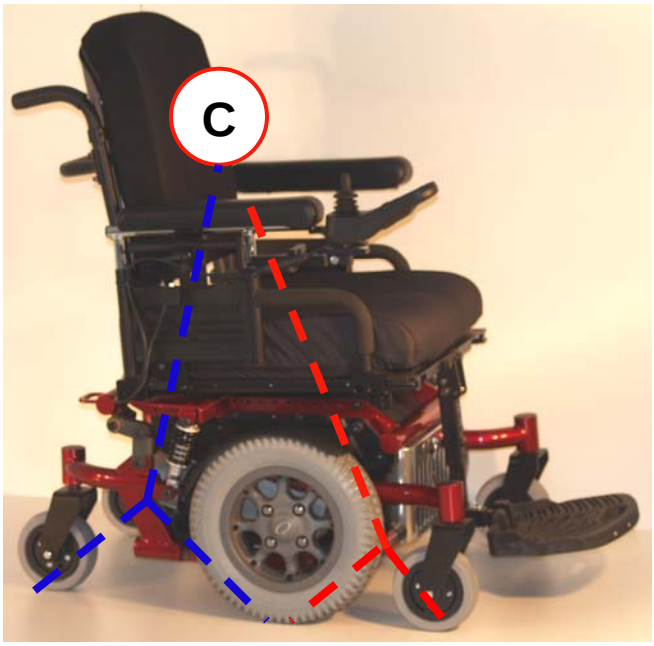


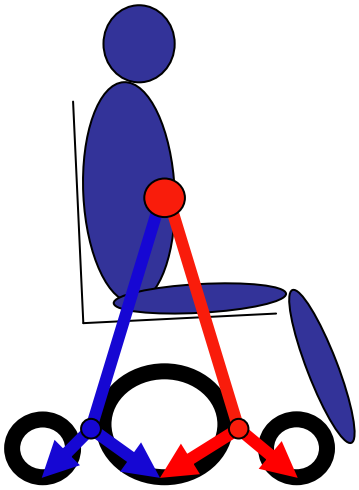
Common impacts

- Limits the chair capability:
  - Limited outdoor performance (traction)
  - Can't climb obstacle from the front
  - Can't climb obstacle from the back
- Affects the resistance on the castors

Gravity control
Design solution: Interactive suspension

- Load distribution over the pivot points
- Redistributed over drive wheel and casters



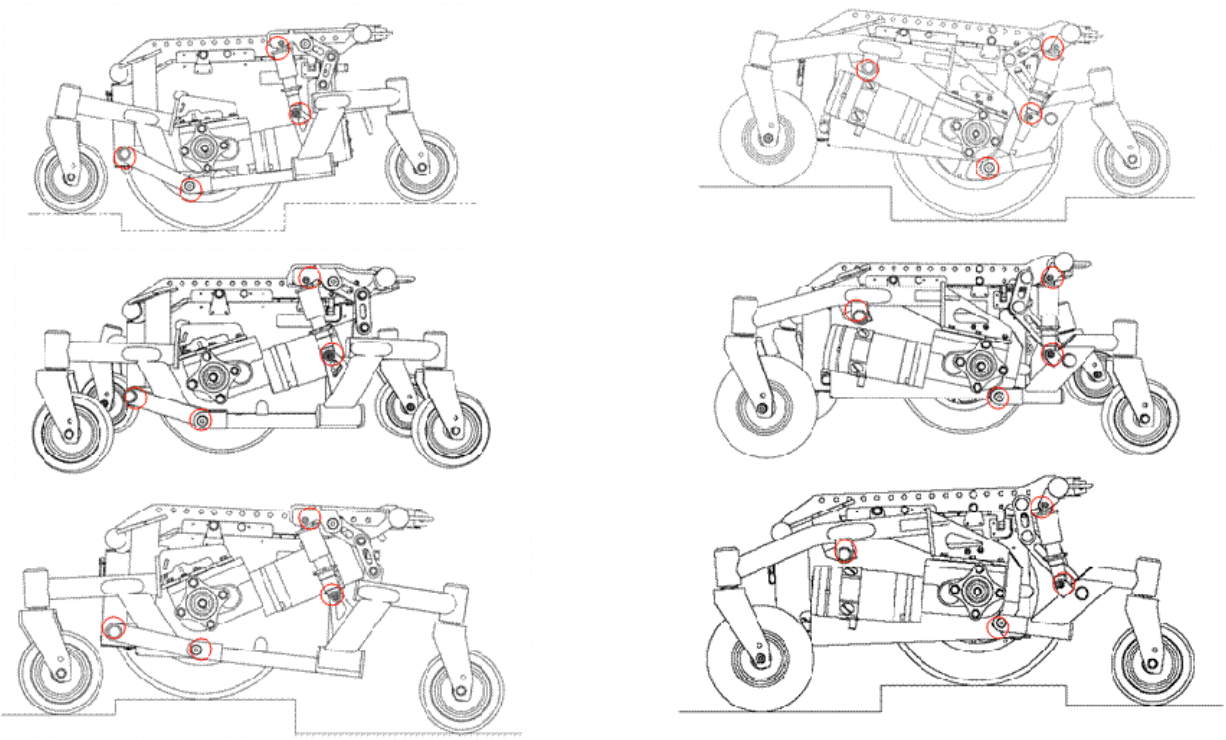


Pictures Showing the Suspension in Use

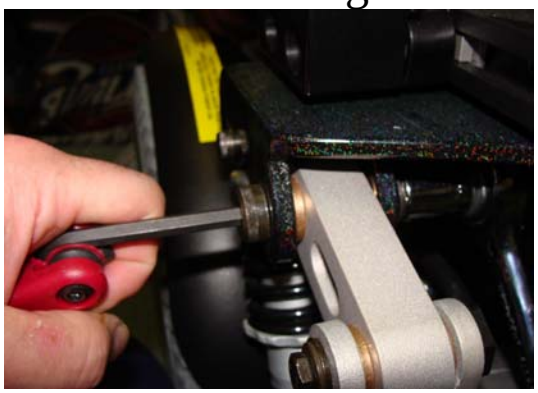
Showing Stability up hill while in tilted position.

Showing the stability while being front loaded.

Pictures Showing the linkage of Suspension

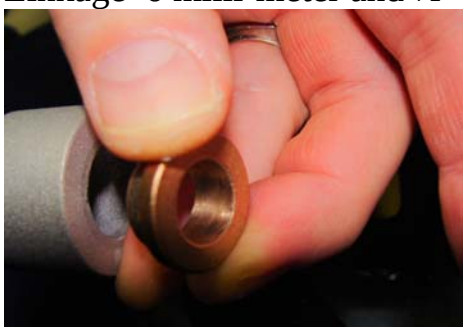


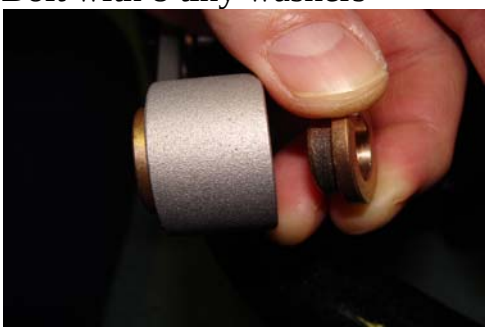
Oil Sealed Bearings



Linkage 6 milli-meter and ½” socket

Bolt with 8 tiny washers





Removal of Oil Sealed bearings is easier than removing bearings
Oil Sealed bearings are recommended to be checked annually replace after

2 years of operation or as a needed basis which can be verified when arms have a lot of play in them. The part number for the Bearings is listed in chart below – quantity per package is listed in chart below.

Pivot arm	Part #	Qty
C-1005	AMY-E00240	4
C-1006	AMY-E00240	4
C-1007	AMY-E00239	2
C-1008	AMY-E00239	2
C-1010	AMY-E00239	4
C-1014	AMY-E00240	4
C-1015	AMY-E00240	4
C-1016	AMY-E00240	4
C-1017	AMY-E00240	4

This can be seen in the parts Manual the first part listing being the section.

C-1006	XPERIENCE MID WHEEL FRONT RIGHT ARM ASSEMBLY	ACTIVE	6.3.2
C-1007	XPERIENCE MID WHEEL REAR LEFT ARM ASSEMBLY	ACTIVE	6.3.3
C-1008	XPERIENCE MID WHEEL REAR RIGHT ARM ASSEMBLY	ACTIVE	6.3.4
C-1014	XPLORE REAR WHEEL FRONT LEFT ARM ASSEMBLY	ACTIVE	6.3.5
C-1015	XPLORE REAR WHEEL FRONT RIGHT ARM ASSEMBLY	ACTIVE	6.3.6
C-1016	XPLORE REAR WHEEL REAR LEFT ARM ASSEMBLY	ACTIVE	6.3.7
C-1017	XPLORE REAR WHEEL REAR RIGHT ARM ASSEMBLY	ACTIVE	6.3.8

The difference between E00240 and 239 is
E00239 is shorter and has a smaller flange.

Part #'s- AMY-E00239 - OILITE 1/2DIA X 5/16 L X 7/8 FL X 1/8THK

AMY-E00240 - OILITE 1/2DIA X 5/8 L X 1 FL X 1/8THK

Shoulder Bolt Adjustment

The shoulder bolt is a key component of the suspension assembly on both the Quickie X series.

Understanding the proper adjustment will help optimize the performance of the power base.

There is 3 basic adjustment adjustments to be performed with this type of fastener;

1. Reduce the compression (to increase the tolerance).
2. Increase the compression (to reduce the tolerance).
3. Reduce the amount of play in a pivot point (to compensate for wear of the bolt itself and/or “Oil-lite” bushing).

The shoulder bolt is designed to offer a consistent length from the shoulder (A) to the head (B). This allows for a precise and consistent fit independently of the amount of torque applied to the nut which prevents for an assembly to be over or under tightened.

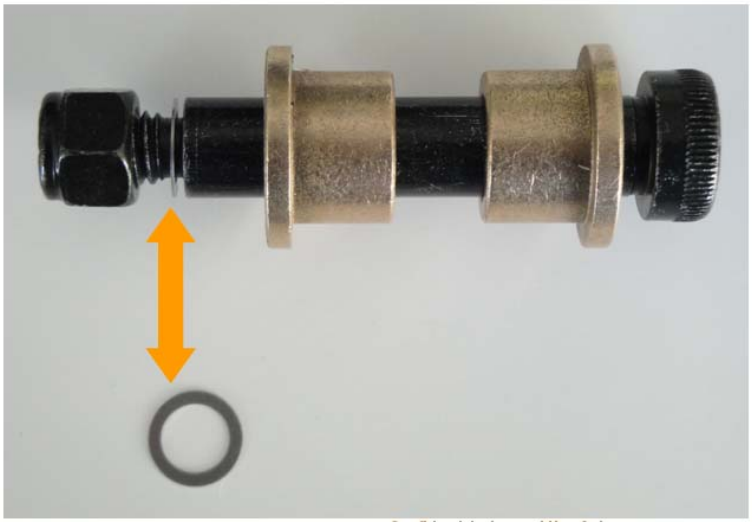
As the nut reaches the shoulder, it simply stops there.

Reducing Compression

1. Reducing the compression of a pivot point is necessary when it can't move smoothly without excessive resistance. Such a situation could prevent the 6 wheels to remain in contact with the floor. Special attention should be paid to:
   - The pivot point of the Front swing arm
   - The pivot point connecting the front swing arm to the rear arm
   - The pivot points of the links (connecting the rear arm to the base)

Reducing the compression of a pivot point

- Process;
  - Adding shim(s) (Part #: AMY E00260) on the threaded part of the bolt will extend it's overall length which allows for a looser fit if needed.



Increasing Compression

Increasing the compression of a pivot point is necessary when too much play can be felt. This could cause excessive camber of the swing-arms. Attention should also be paid to:

- The pivot point of the Front swing arm
- The pivot point connecting the front swing arm to the rear arm
- The pivot points of the links (connecting the rear arm to the base)

Increasing the compression of a pivot point

- Process;
    - Adding shim(s) (part #: AMY E00281) at the thickest part of the stem will reduce the overall length of the bolt which allows for a tighter fit.

Reducing the Play

Reducing the amount of play may become necessary after a certain period of time when the “Oil-Lites” bushings wear down or compress and deflect.

- When the inner hole gets deformed into an oval shape; The “Oil-Lite” bushing provides more play to the pivot point that may cause excessive camber of the swing arm. This situation can be resolved with the replacement of the worn-down components. In order to insure proper fit, it is recommended to always replace both the fastener and the “Oil-lite” bushings at the same time on any of the pivot points. The replacement must be performed with respect to proper compression adjustments previously indicated.

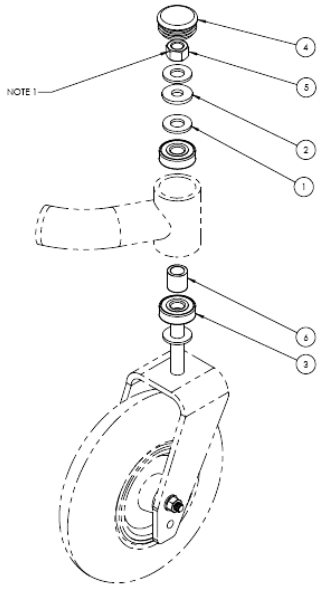
Shock - AMY- 011631-004 Shock

Anti Flutter Kit for Xplore Rear Wheel Drive Chair

KIT #	DESCRIPTION
S-0001	KIT CORRECTION FOR FLUTTER FIX (FOR REAR PROPULSION BASE)

ITEM NO.	PART NUMBER	DescriptionAng	QTY
1	E00247	FLAT WASHER 1/2"	12
2	E00284	NEOPRENE WASHER	4
3	J00010	SPACER 1/2 X 1-3/8 X 7/16 - 1621 RS	8
4	K00020	ROUND TUBE CAP	4
5	E00221	NYLON LOCK NUT 1/2-20	4
6	A1018	BEARING SPACER	4

NOTE : QUANTITIES FOR 4 WHEELS KIT



NOTE 1: WARNING : DO NOT OVER TIGHTEN TIGHTEN USING THE MINIMUM TORQUE THAT IS REQUIRED TO ELIMINATE FLUTTER.

WARNING
BEFORE DELIVERING A PRODUCT, THE DEALER MUST VERIFY WHILE THE USER IS SITTING IN THE SEATING SYSTEM THAT THE CENTER OF GRAVITY AND OVERALL STABILITY OF THE WHEELCHAIR IS MAINTAINED AND OPTIMAL IN ALL COMBINATIONS OF TILT, RECLINE OR ELEVATION.

amy SYSTEMS | PARTS MANUAL | REV: 00 2009-06-03 | S-0001

Make sure when changing out components that it is torqued to 40 inch pounds.

Xperience and Xplore Characteristics

Turning radius		
Wheelchair type / legrest type	**Footboard**	**Footrest**
Mid Wheel Drive	22''	24.5''
Rear wheel drive	28''	30.25'' *

Wheelbase weights (in pounds)				
	Mid		Rear	
Configurations	Compact	Full	Compact	Full
No motorization, No batteries	212	215	210	213
Addition of batteries	75	105	75	105
Addition of a tilt (C-6400)	35	35	35	35
Addition of a elevating seat (C-4200)	42	42	42	42
Addition of a combo (C-4200+C-5200)	77	77	77	77

Electronics Section

Introduction: The electronics used are from a company called PG Drives – they are very durable units that exceed expectations of normal driving on level ground. The Controlling device is the input to the operation of the chair – therefore it is a very important choice when deciding which unit to use and pick – this section will help you decide by understanding the operating system and its complete functionality.

VR2 Electronics

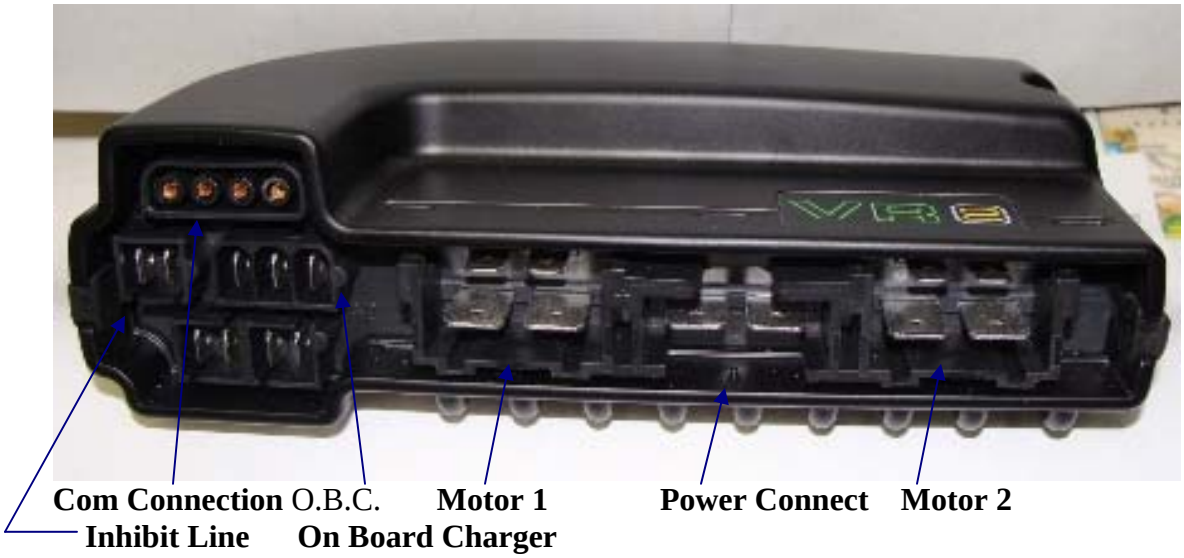
Features:
Battery Display
On/ Off Switch
4 pin cable
Horn
Speed/Drive Select
Increase / Decrease
Actuator Operation

VR2 – 6 Button Joystick – AMY-D50680

Operation:

This joystick has a Green On-Off switch with Red horn and top display gives indication of both battery capacity and Diagnostic Codes. The center indicators are 5 individual yellow LED lights that indicate either Speed (if module is set to "0" profile) or individual lights indicating separate drive profiles up to 5. The operation of those indicators is accomplished by pressing the right Speed/Drive select to increase or the left Speed/Drive select to decrease the speed or drive. The Actuator or Seating buttons indicate via a RED LED that it is active and a Forward and Reverse action to operate the actuator. The 4-pin connector connects to a communication 4-pin connector that connects back to the Motor Control.
The VR2 has 2 other models available – a unit without actuator - D50677 - and another unit –D50871 -very much like the unit above but inclusive with Speed Potentiometer and Toggle Switch.

VR2 Control Module – AMY -D51086



The control module has many inputs to facilitate operation of the chair. The picture above shows the main inputs of the 4-pin connector that runs back to the joystick. The Motor/Brake connection for Left and Right motors – marked on the control as M1 and M2 for these will vary depending on Mid-wheel drive or Rear wheel drive. Shows the input of Battery – this module has left open the Actuator Port – marked on picture as A2 and has an A1 and A2 input for up to two actuators to operate.

R-NET Electronics

R-Net LCD Joysticks

Standard

Part # D50616

Toggle(s) and/or Speed Pot

Part # D50855

Part # D50854

The Mono-Chrome or LCD Joystick has very Powerful features including a variety of Models with or without switches and Speed Potentiometer to give even more control of speed in each Drive Profile. There are 4 Main Buttons – not including the Green Power On Off – the Red Horn button – the Profile button which takes you to all the different set or programmed Drive Profiles – the Mode button which takes you from Drive to Seating to Program Mode if you have a Programming Key or Dongle in-line with the Joystick. This will be explained in more depth on the Programming part of this section. The Speed Up and Down buttons are used to give the Forward High Speed setting down to Forward Low Speed setting. This is also used to increase and decrease the programming settings along with use with the Blue tooth mouse as left and right click.

EL LED Joystick Module

Standard

On/Off Button

Horn Button

Mode Button

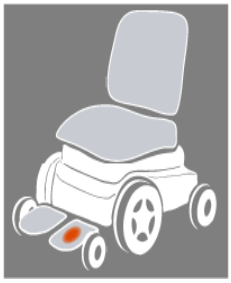
Speed Up/Down Buttons

Note: 'Seating' requires use of the R-net-ISM (Intelligent Seating and Lighting Module)

ISM

Part # - AMY-D51122

This JSM functions much like the Pilot+. LED's will illuminate under the wheelchair ICON to indicate selected actuator(s).



The EL or LED joystick is one of the easiest operating screens. The LED's indicate what drive the user is in – the mode button will take you through the Modes and indication of seating will illuminate the display as seen on example above of Foot rest left side being illuminated.

The use of an ISM is necessary for Drive Through operation to give the mode option display of screen for actuator movement.

Color Joystick Modules

On/Off Button

Horn Button

Profile Button

Mode Button

Speed Up/Down Buttons

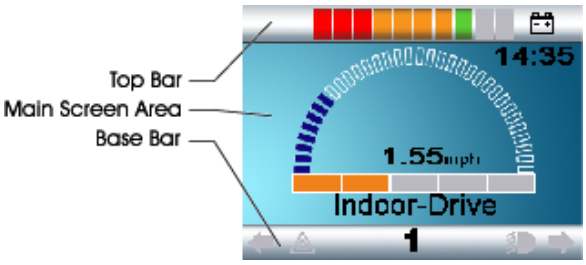
Color LCD Display

Part # - AMY-D51033

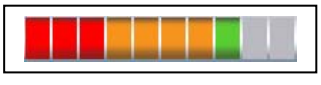
Optional Toggle(s) and/or Pot

D51136 D51138

The color LCD screen is split into 3 areas of information. The Top Bar, the Base Bar and the Main Screen Area.



Top Bar - Battery Indicator



This displays the charge available in the battery and can be used to alert the user to the status of the battery.

Main screen: gives information pertaining to Time – Speed of Chair – and Profile Name as well as Mode and Speed Pot info.

Base bar : gives information pertaining to Drive Number and indications.

Dual Attendant Module R-NET

Part # AMY-D50882

- The Dual-Attendant Module is used for when driving and seating access is required by an individual other than the primary user.

- The 'User/Attendant' button is used to toggle between 'who' has control of the chair. The LED indicates who is in control.

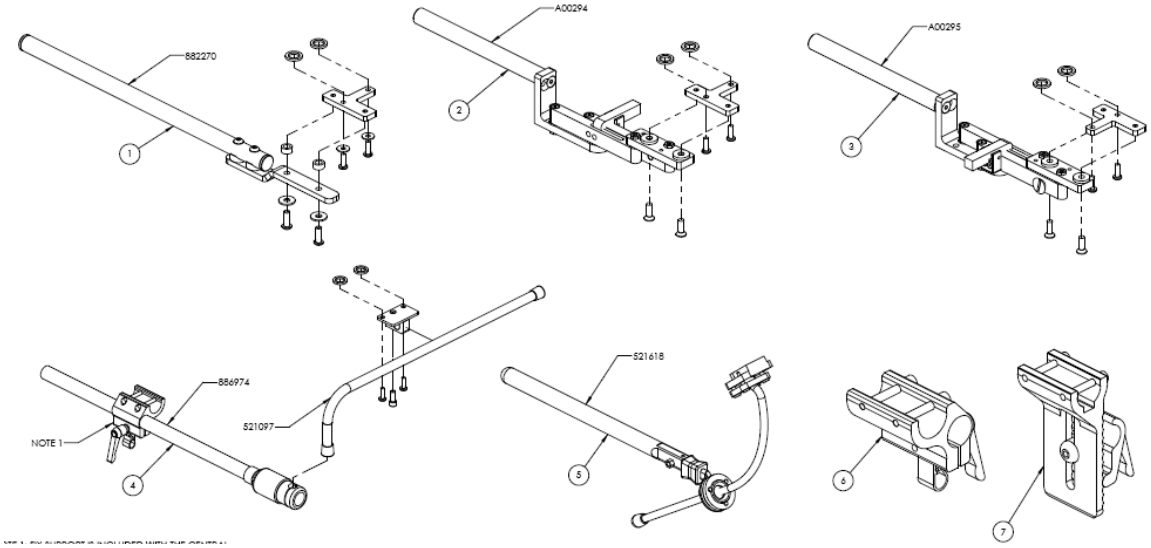
  It is the Attendant that has control of who has control of the the chair.

- The Speed button scrolls through the speed settings.

- The 'Mode' button accesses all the modes.

AMY - D50872 - VR2 Attendent

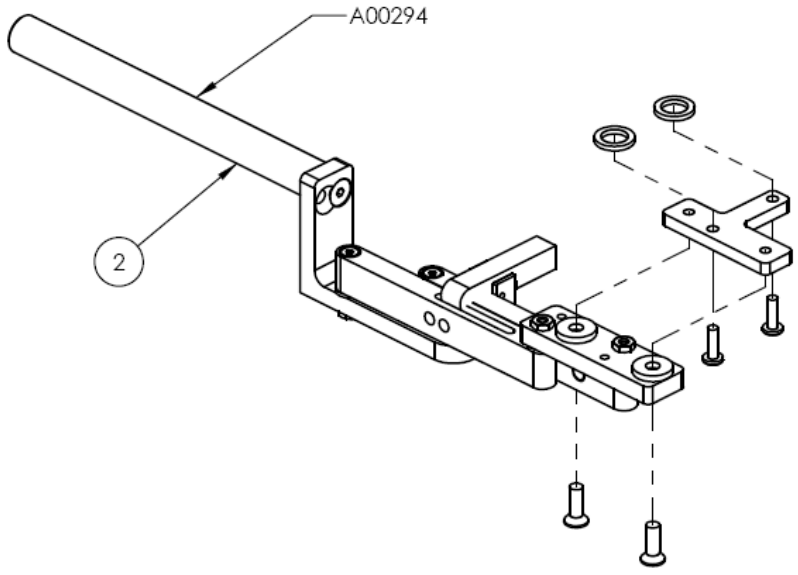
Joystick Swing-Away Assembly



Below is Table of Parts to Order for above numbers

ITEM #	KIT #	DESCRIPTION
1	C-3427	FIX JOYSTICK MOUNT
2	C-3428	RH. ADJUSTABLE JOYSTICK MOUNT
3	C-3429	LH. ADJUSTABLE JOYSTICK MOUNT
4	C-3430	CENTRAL MOUNT JOYSTICK SUPPORT
5	521618	MOUNT FOR OMNI. SYSTEMS ONLY
6	920713	FIX SUPPORT
7	920738	HEIGHT ADJUSTABLE SUPPORT

A larger depiction of our standard mount below:

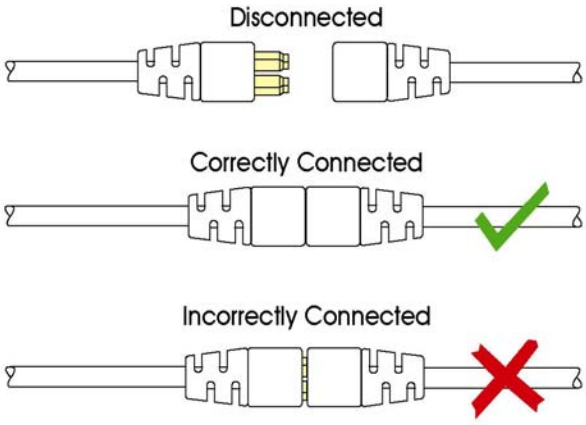


Mating Connectors

To connect the Communication Cables:

- Holding the connector housing, firmly push the connector into its mate until you can no longer see the yellow plastic.

The connectors are secured using a friction system.



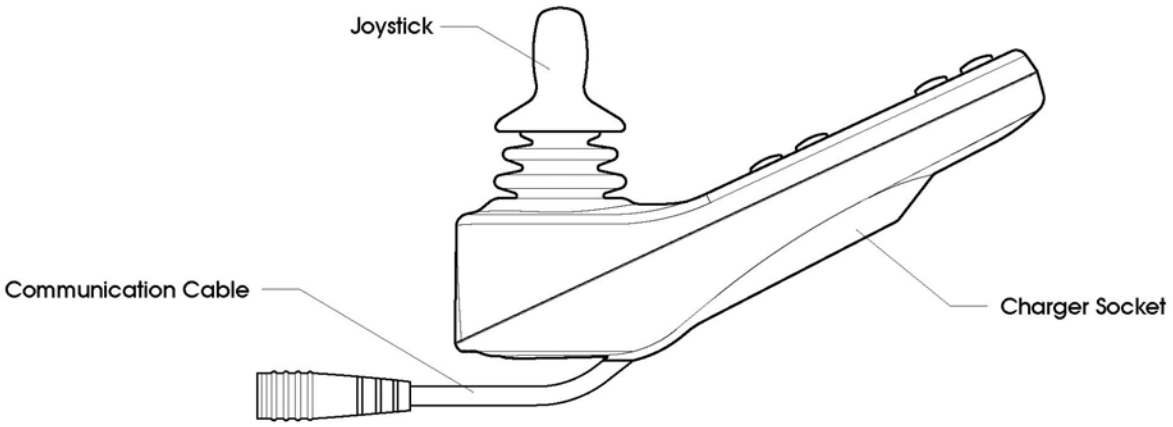
To disconnect the Communication Cables:

- Holding the connector housing firmly, pull the connectors apart.

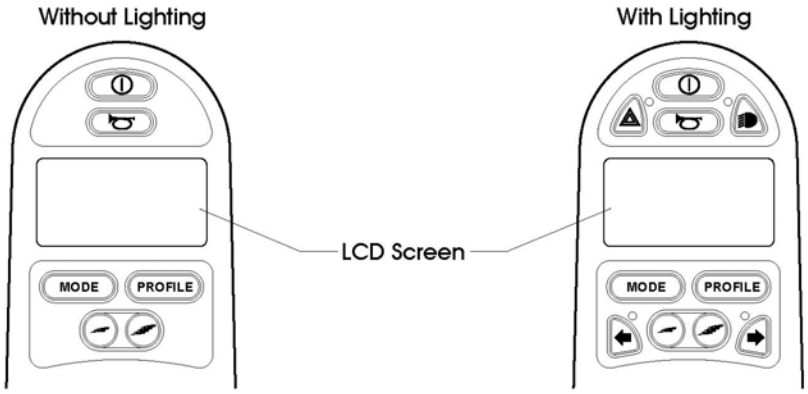
Do not hold or pull on the cable. Always grip the connector when connecting and disconnecting.

When the control system is first switched on after a connection, or system component change the Timer will be displayed whilst the system checks itself and then the Re-start icon will be displayed. Switch the control system off and on again to operate.

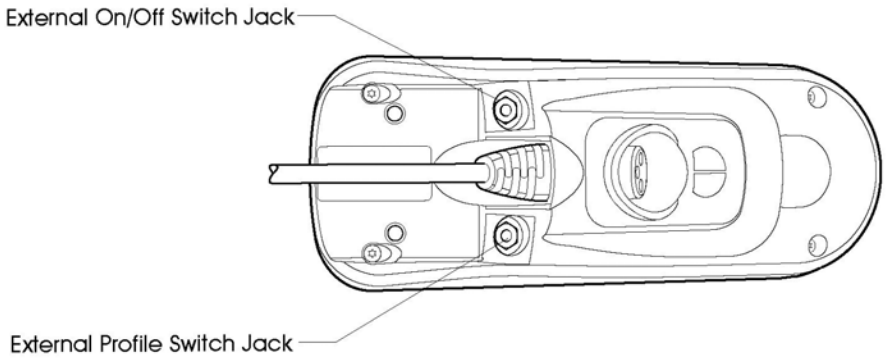
JOYSTICK MODULE



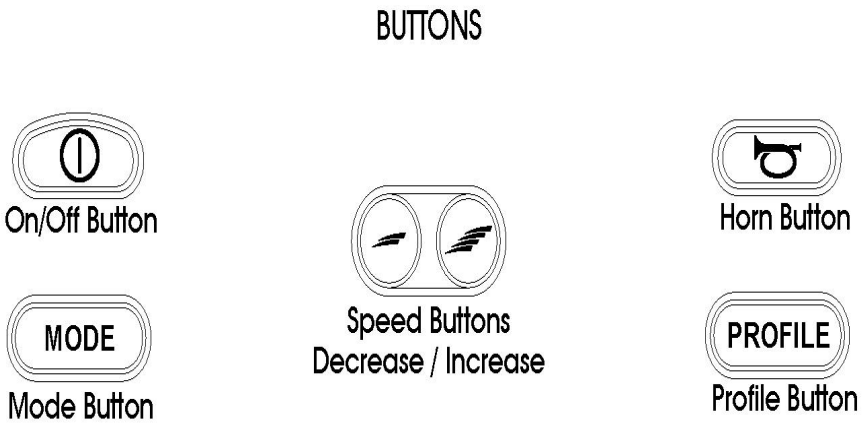
CONTROL PANEL VARIANTS



JACK SOCKETS

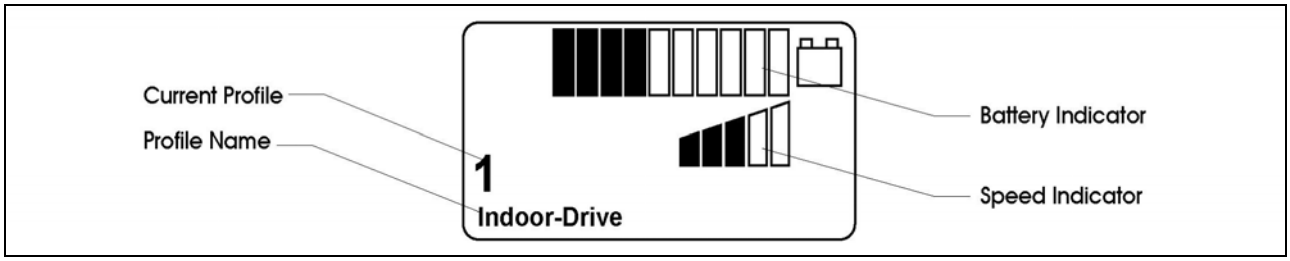


Joystick Buttons



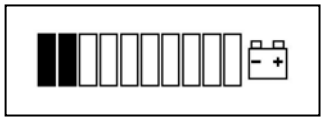
Screen Symbols

The Drive screen for the R-net has common components, which will always appear, and components that will only appear under certain conditions. Below is a view of a typical Drive screen in Profile 1.



5.1.1 Battery Indicator

This displays the charge available in the battery and can be used to alert the user to the status of the battery.



Steady

This indicates that all is well.

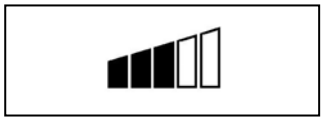
Flashing Slowly

The control system is functioning correctly, but you should charge the battery as soon as possible.

Stepping Up

The wheelchair batteries are being charged. You will not be able to drive the wheelchair until the charger is disconnected and you have switched the control system off and on again

5.1.2 Speed Indicator



This displays the current speed setting.

The speed setting is adjusted using the Speed Buttons.

Current Profile

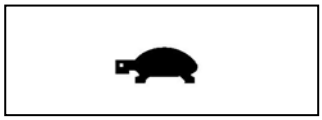
The Profile Number describes which Profile the control system is currently operating in.

The Profile Text is the name or description of the Profile the control system is currently operating in.

In Focus

When the control system contains more than one method of direct control, such as a secondary Joystick Module or a Dual Attendant Module, then the Module that has control of the wheelchair will display the In Focus symbol.

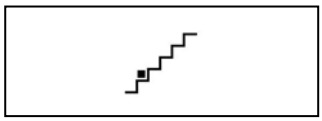
Speed Limit



If the speed of the wheelchair is being limited, for example by a raised seat, then this symbol will be displayed.

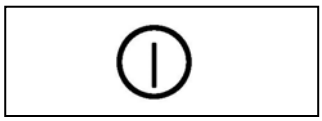
If the wheelchair is being inhibited from driving, then the symbol will flash.

Latched



When the control system is operating in a latched condition this symbol will be displayed.

Restart

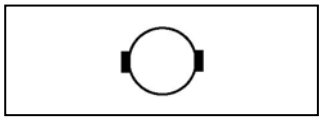


When the control system requires a reboot; for example, after a module re-configuration, this symbol will be flashed.

Fault

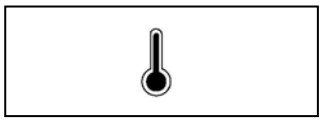
The control system can detect a wide variety of errors. When the system has detected an error that is not severe enough to cause the system to trip, then this symbol will be displayed.

Motor Temperature



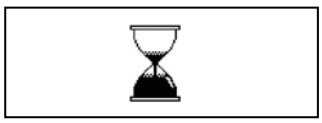
This symbol is displayed when the control system has intentionally reduced the power to the motors, in order to protect them against heat damage.

Control System Temperature



This symbol is displayed when the control system has intentionally reduced its own power, in order to protect itself against heat damage.

Timer



This symbol is displayed when the control system is changing between different states. An example would be entering into Programming Mode. The symbol is animated to show the sands falling.

E-Stop

If the control system is programmed for latched drive or actuator operation, then it is normal for an Emergency Stop Switch to be connected into the External Profile Switch Jack. If the Emergency Stop Switch is operated or disconnected, this symbol will flash.

Environmental

When Environmental Mode is entered the screen will display the following icon.

Bluetooth

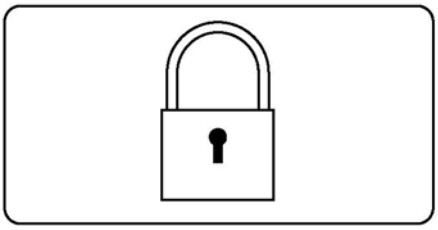
When Bluetooth Mode is entered the screen will display the following icon.

Momentary Screens

If the momentary screens are programmed to be displayed then pressing the Speed or Profile Buttons will display screens such as below.

Keypad Locking

The following screen will be displayed.

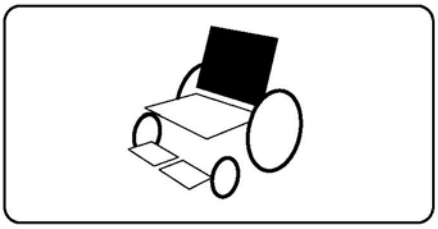


Note: Mote details given of operation and setting in Diagnostic Section

Actuator Selection Screen

To adjust the seat position the actuator screen must be visible.

Depress the Mode Button to scroll through the Mode screens until you reach the actuator screen, displayed below.

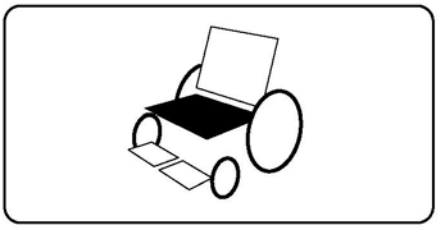


Actuator adjustment is achieved as follows.

- Move the Joystick sideways to select the desired axis.

(This is indicated by the section of the wheelchair that is highlighted)

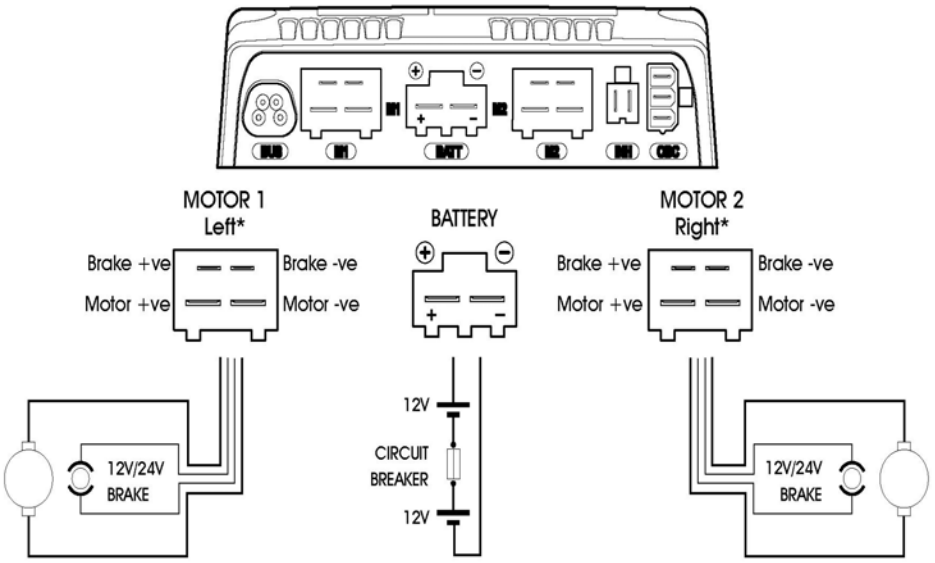
- Move the joystick forwards and backwards to move the actuator.



- Repeat these steps for each actuator that requires adjustment.

To drive again depress the Mode button until the Drive screen is reached or, in the case of the LED joystick module, until the Speed Indicator returns to its normal state.

R-Net Control Modules – both EL-90 and R-Net 120 – known as PM or Power Modules both have same input configuration on Control module.



* Assumes no Motor Swap programming has been undertaken

* The setup above is for the Xplore Chair if the Motors are connected for the Xperience You will see Left Change over to Motor 2 and vice versa.

R-Net EL-90 Control Inputs Depicted Below

Com Connection O.B.C. **Motor 1** **Power Connect** **Motor 2**

Inhibit Line **Off Board Charger**

PROGRAMMING

3 Different Electronics so different means of Programming

VR2 – Electronics Programming

QTRONIX or PP1

or

PC Mobility Programmer – AMY-D50144

R-Net EL – Electronics Programming

AMY-D50612 complete as seen above

The Dongle Kit can be used for Computer only

AMY-EC-0084 complete with Wires and manual

The Diagnostic Test tool can be used the same as on PM120 controls

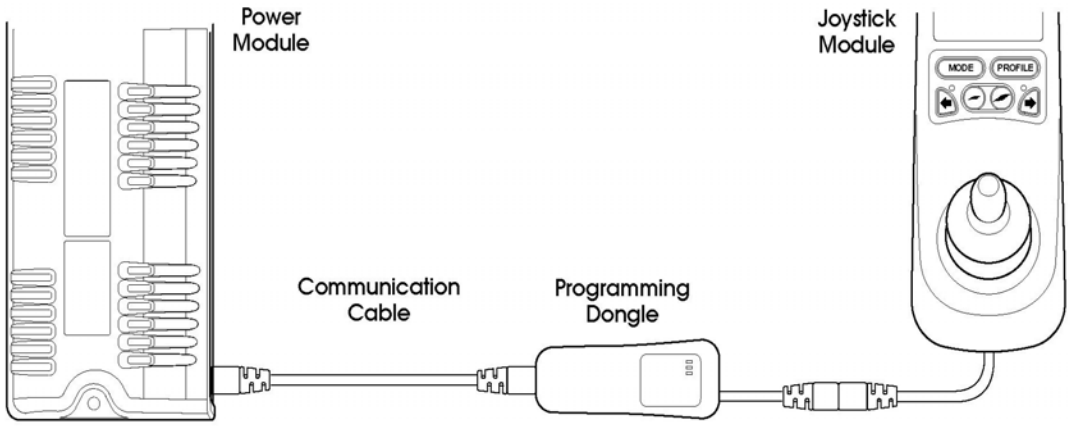
R-NET PM120 – Control System

The AMY-D50612 - kit can be used as in the EL programming or you can use the Dongle connected to the System to do ***On-Board programming*** of the System without connecting to a computer. The OBP Dealer Dongle is part number AMY-D50109

R-net On-Board Programming

On-Board Programming (OBP) uses the graphics LCD on the R-net Joystick Module to provide a clear display of multiple profiles, and allows for easy navigation and adjustment of the screens, using intuitive combinations of joystick movements and button presses. Access to OBP can be made secure via a keycode or a hardware key (dongle).

A diagram is shown below how it connects to the system:

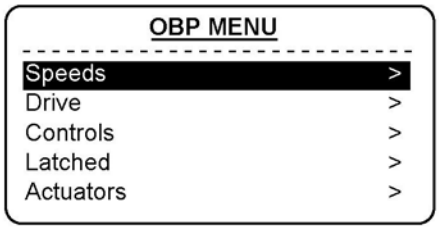


- Turn off the control system.

Insert the R-net Dongle along the communication cables in the system configuration
Note: Dongle part number AMY- D50109 or Kit Part # AMY-D50112

- Turn on the control system

After initialization press the Mode key until the OBP screen is reached. See following diagram:



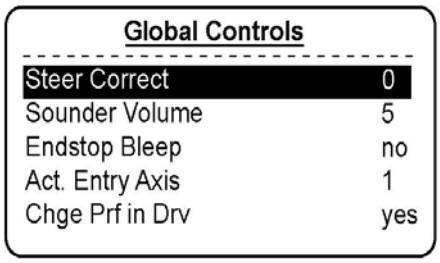
Note: Mode 8 is the Mode for OBP – very important not to shut off or you will not have function of OBP.

Navigating the OBP Screens

While in OBP deflecting the joystick to the left, while the parameter title is highlighted, will display an elongated version of the parameter name.

There are two basic forms of display screen – one which shows global parameters and one which shows parameters which are profile dependent, i.e. can have different values in each of the drive profiles.

Example of a global parameter screen:



Forward joystick deflections will select the parameter above.

Reverse joystick deflections will select the parameter below.

Left joystick deflections will take you to the previous screen.

Right joystick deflections will have no effect.

Example of a profiled parameter screen:

FWD	Pr1	Pr2	Pr3	Pr4
Acc ▲	30	35	40	45
Acc ▼	20	20	20	20
Dec ▲	40	40	45	50
Dec ▼	30	30	30	30
Spd ▲	70	80	90	100
Spd ▼	20	25	30	20

Forward joystick deflections will select the parameter above.

Reverse joystick deflections will select the parameter below.

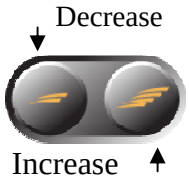
The first left joystick deflections will display the parameter name in full.

The second left joystick deflection will take you to the previous screen.

Right joystick deflections will select the parameter to the right, if available.

Making an Adjustment

Once the parameter for adjustment has been selected, the Speed buttons can be used to make adjustments.

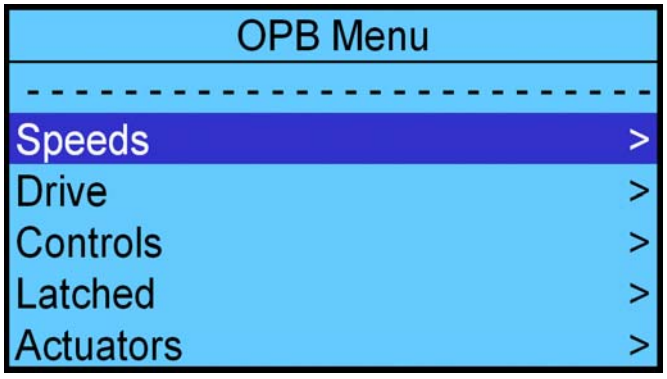


Speed Up/Down Buttons

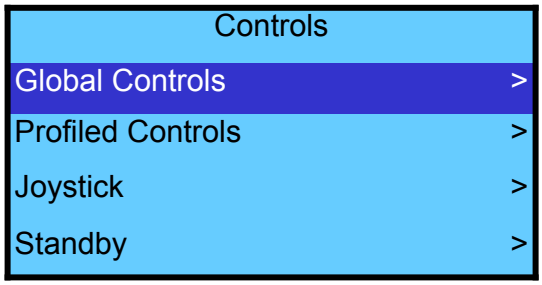
To ensure all new values are stored correctly, exit OBP mode with a series of left hand joystick deflections. A push of the Mode button will put you back to Drive mode and save as well.

Example of OBP Menus

‘Top’ Menu



‘Sub’ Menu



‘Sub-Sub’ Menu

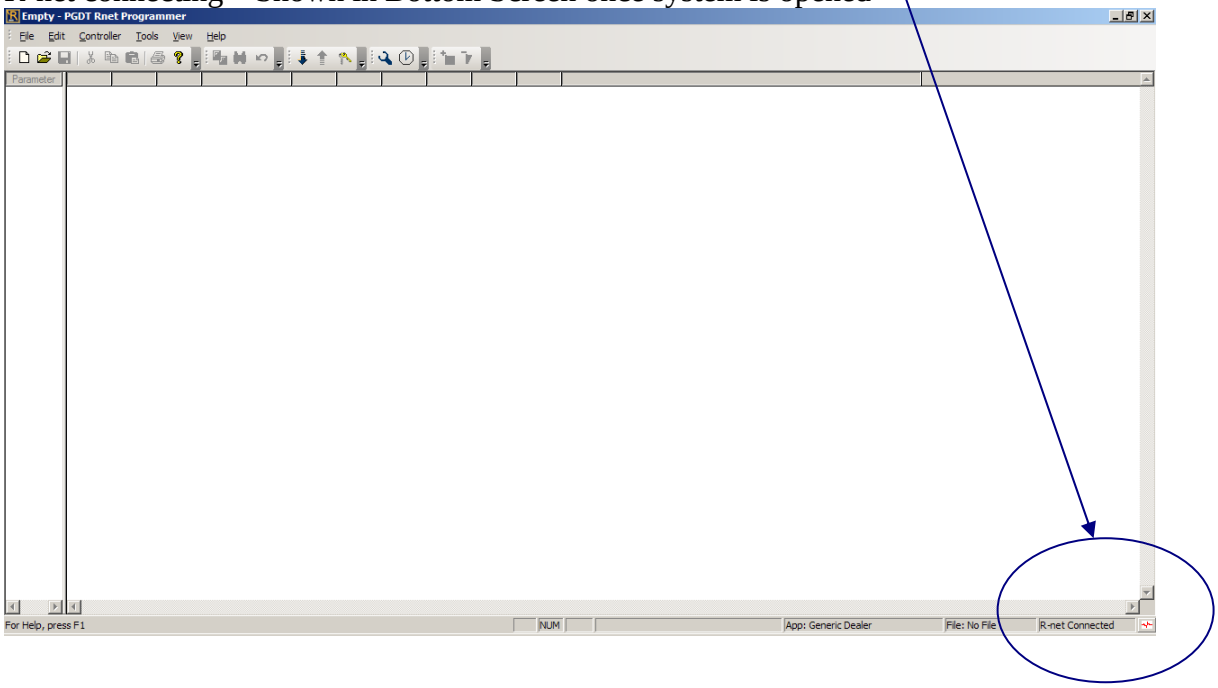
- There are four basic types of menus;
  - ‘Top’ Menu;
  - ‘Sub Menu
  - ‘Sub-Sub Menu
  - Parameter Field

‘Parameter Field’

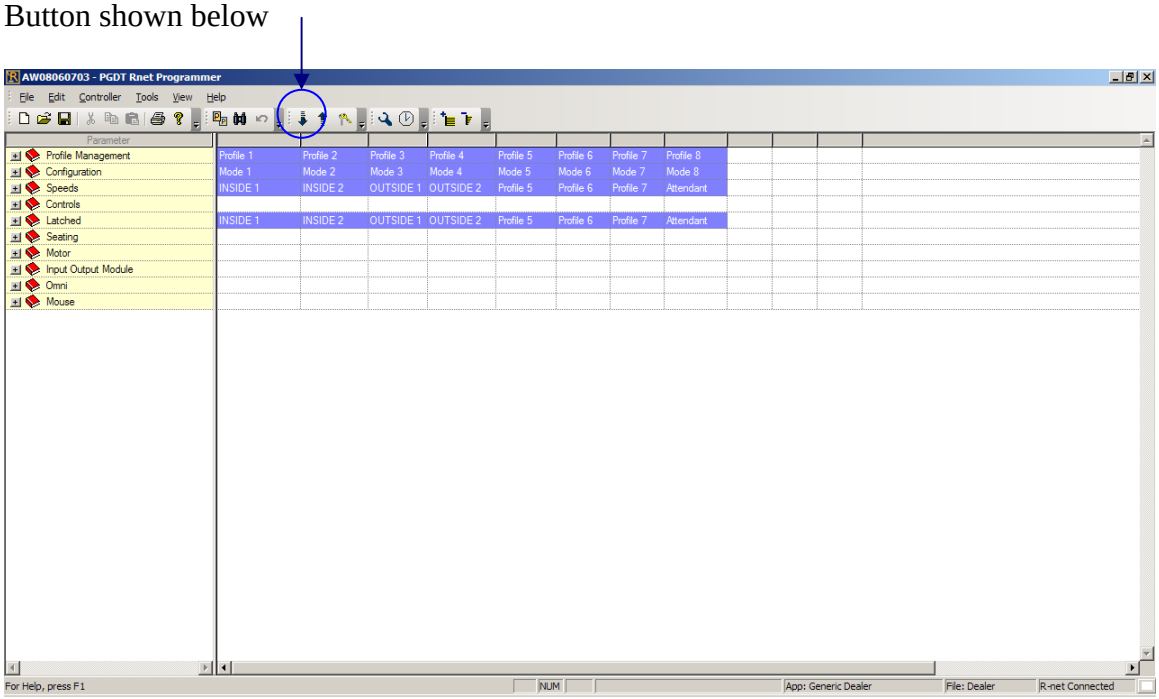
Drive	Pr1	Pr2	Pr3	Pr4
Power	100	50	100	100
Torque	80	50	80	80
Trmor	0	0	0	0

PC Programming and Dongle Usage

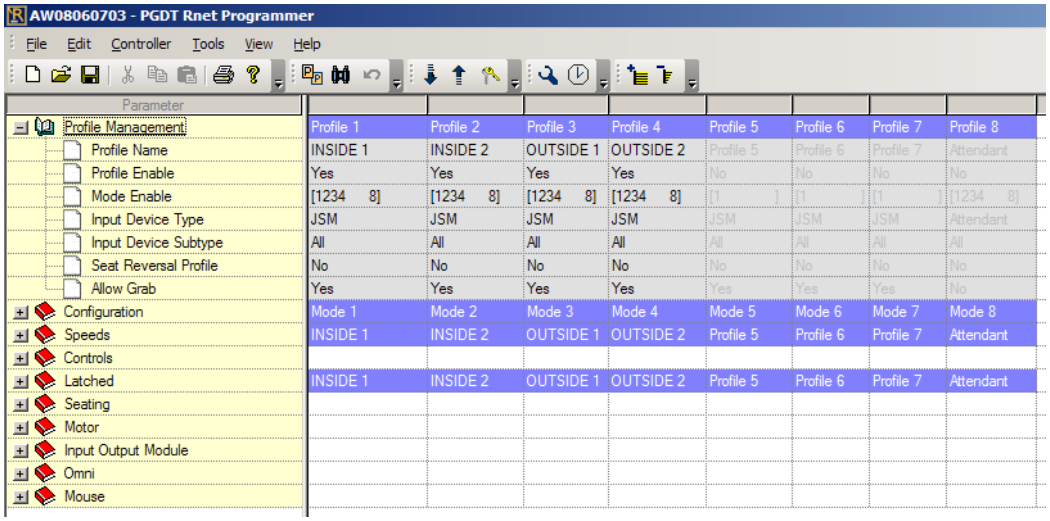
R-net connecting – Shown in Bottom Screen once system is opened



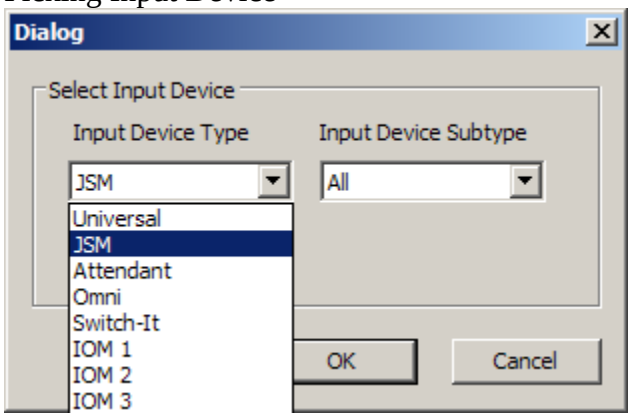
Downloaded – This is what screen will appear after you have clicked on Download Button shown below


AW08060703 - PGDT Rnet Programmer
File Edit Controller Tools View Help
Parameter
Profile Management
Configuration
Speeds
Controls
Latched
Seating
Motor
Input Output Module
Omni
Mouse
Profile 1 Profile 2 Profile 3 Profile 4 Profile 5 Profile 6 Profile 7 Profile 8
Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6 Mode 7 Mode 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
For Help, press F1
NUM
App: Generic Dealer
File: Dealer
R-net Connected

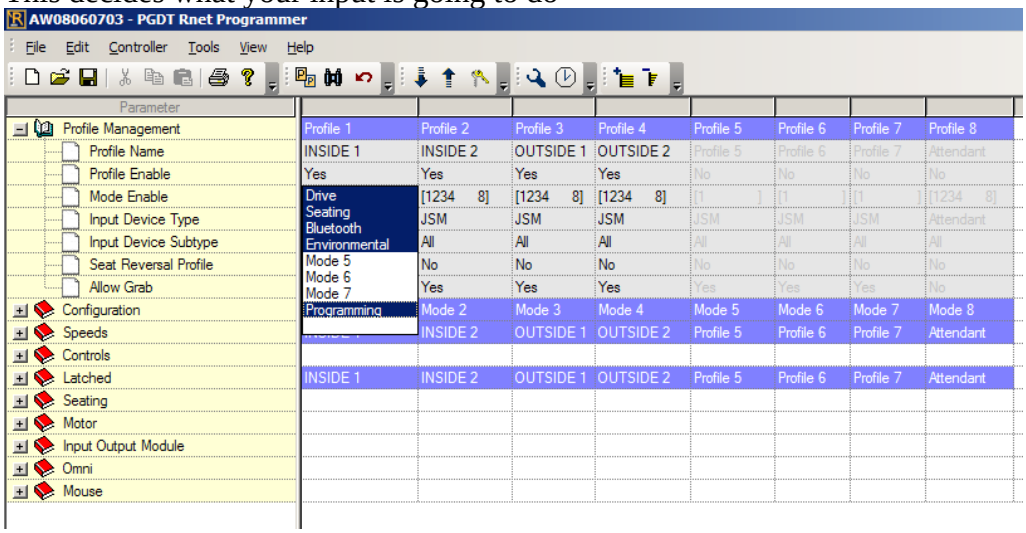
Profile Management – Allows various changes to your Profile – such as picking input device shown below:


AW08060703 - PGDT Rnet Programmer
File Edit Controller Tools View Help
Parameter
Profile Management
Profile Name
Profile Enable
Mode Enable
Input Device Type
Input Device Subtype
Seat Reversal Profile
Allow Grab
Configuration
Speeds
Controls
Latched
Seating
Motor
Input Output Module
Omni
Mouse
Profile 1 Profile 2 Profile 3 Profile 4 Profile 5 Profile 6 Profile 7 Profile 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
Yes Yes Yes Yes No No No No
[1234 8] [1234 8] [1234 8] [1234 8] [1] [1] [1] [1234 8]
JSM JSM JSM JSM JSM JSM JSM Attendant
All All All All All All All All
No No No No No No No No
Yes Yes Yes Yes Yes Yes Yes No
Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6 Mode 7 Mode 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant

Picking Input Device

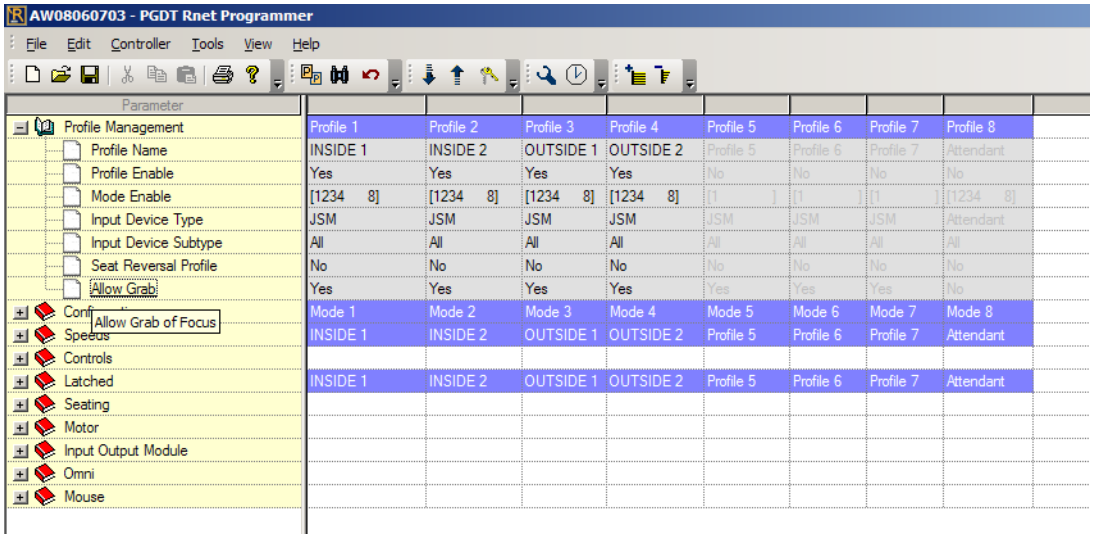


This decides what your input is going to do



Allow Grab

Example: To prevent a user gaining control from the Profile that is used by the Attendant control. The system if set up as below.


AW08060703 - PGDT Rnet Programmer
File Edit Controller Tools View Help
Parameter
Profile Management
Profile Name
Profile Enable
Mode Enable
Input Device Type
Input Device Subtype
Seat Reversal Profile
Allow Grab
Allow Grab of Focus
Speeds
Controls
Latched
Seating
Motor
Input Output Module
Omni
Mouse
Profile 1 Profile 2 Profile 3 Profile 4 Profile 5 Profile 6 Profile 7 Profile 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
Yes Yes Yes Yes No No No No
[1234 8] [1234 8] [1234 8] [1234 8] [1] [1] [1] [1234 8]
JSM JSM JSM JSM JSM JSM JSM Attendant
All All All All All All All All
No No No No No No No No
Yes Yes Yes Yes Yes Yes Yes No
Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6 Mode 7 Mode 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant

Profiles 1 to 4 are set for any type of user Input Device

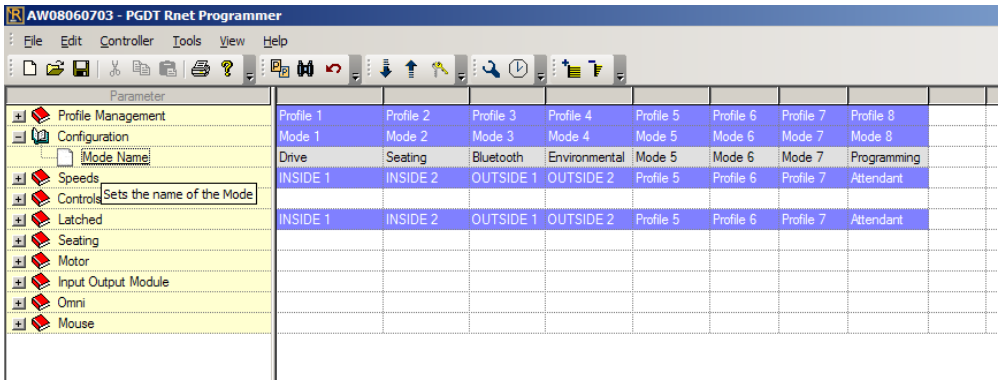
Profile 8 is set for Attendant control

The Select parameter in Profiles 1 to 4 does not include Profile 8, meaning the user cannot select Attendant control.

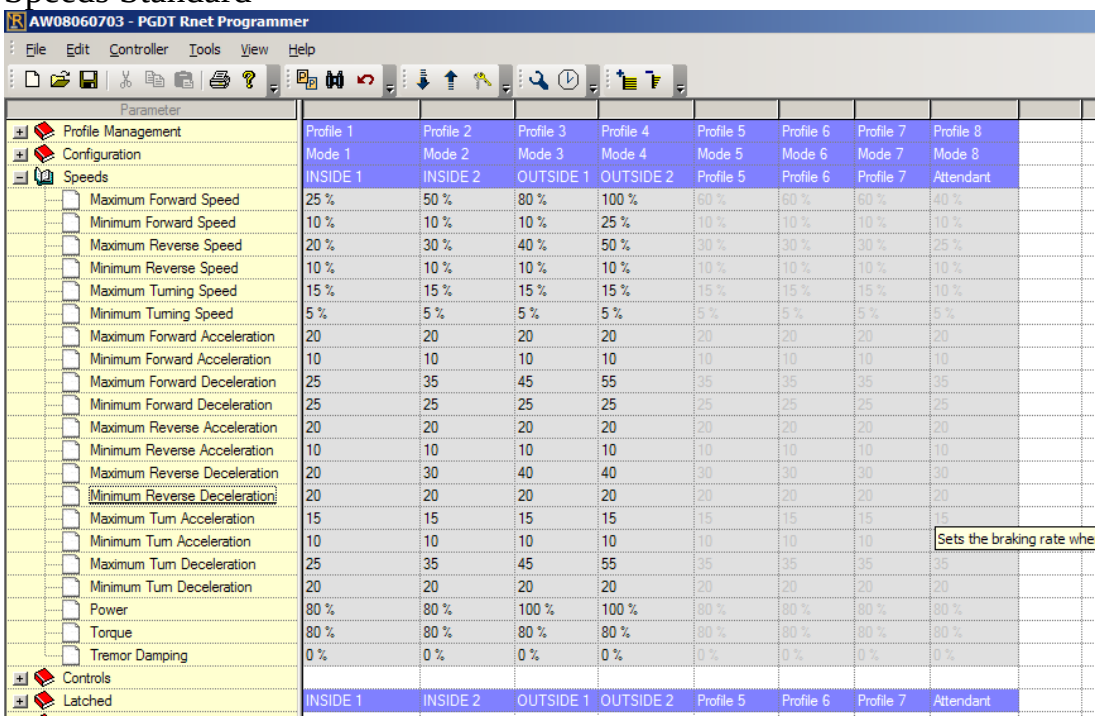
The Select parameter in Profile 8 includes all Profiles, meaning the Attendant device can always select its own Profile.

The Grab parameter in Profiles 1 to 4 does not include Profile 8, meaning the user can move between Profiles 1 to 4, but cannot gain control from Profile 8 (the Attendant Profile)

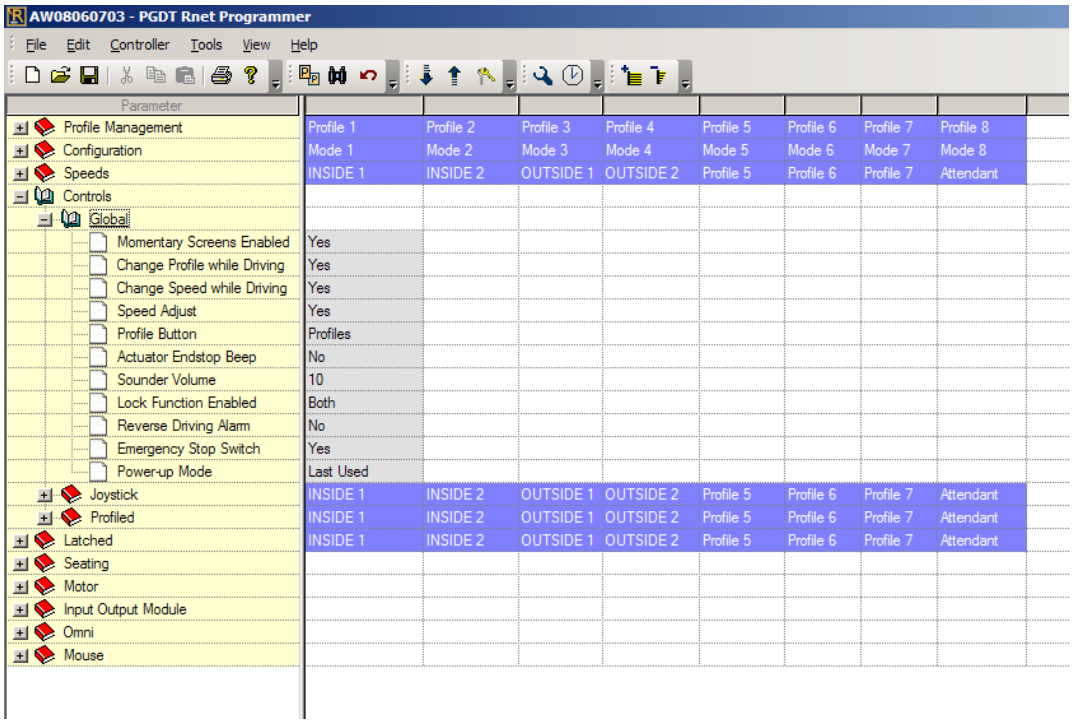
The Grab parameter in Profile 8 includes all Profiles, meaning the Attendant can gain control from any other Profile.

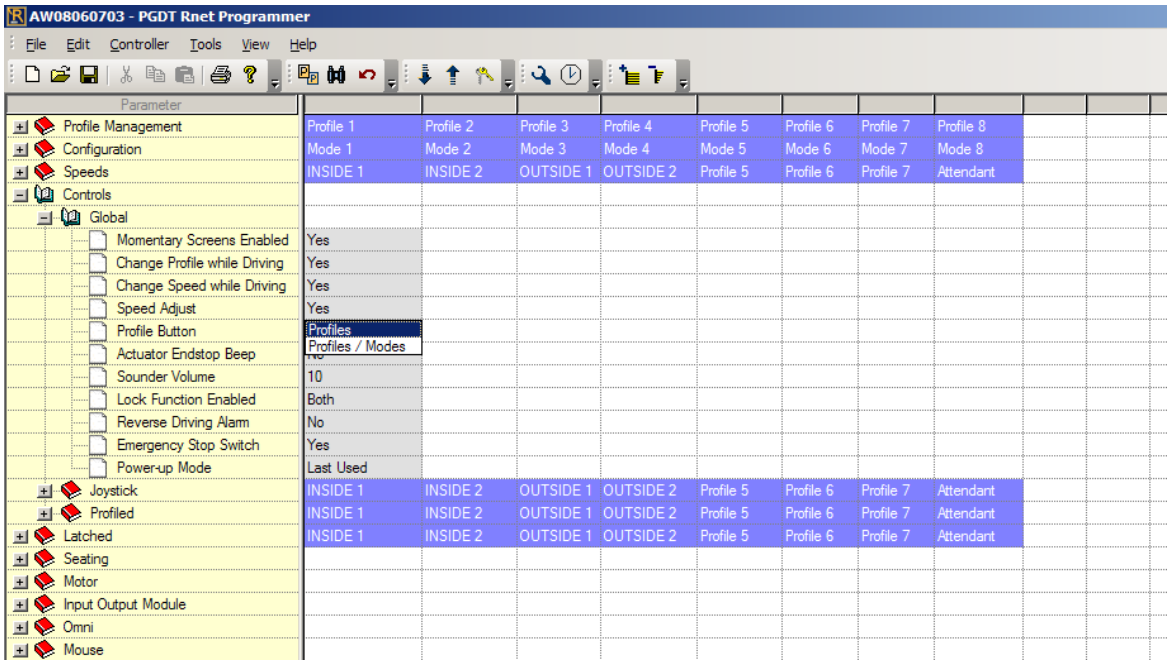

AW08060703 - PGDT Rnet Programmer
File Edit Controller Tools View Help
Parameter
Profile Management
Configuration
Mode Name
Speeds
Controls
Sets the name of the Mode
Latched
Seating
Motor
Input Output Module
Omni
Mouse
Profile 1 Profile 2 Profile 3 Profile 4 Profile 5 Profile 6 Profile 7 Profile 8
Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6 Mode 7 Mode 8
Drive Seating Bluetooth Environmental Mode 5 Mode 6 Mode 7 Programming
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant

Speeds Standard

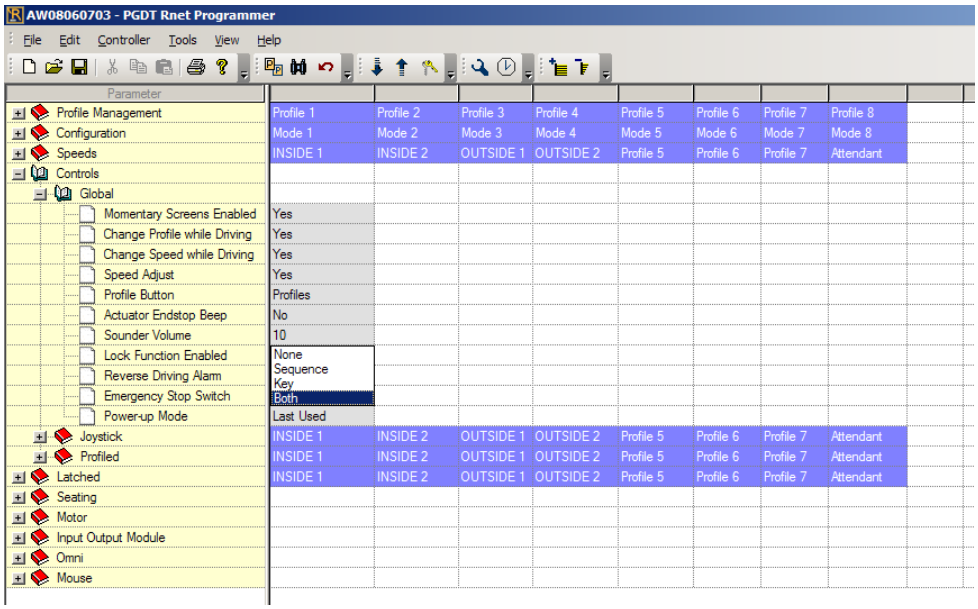

AW08060703 - PGDT Rnet Programmer
File Edit Controller Tools View Help
Parameter
Profile Management
Configuration
Speeds
Maximum Forward Speed
Minimum Forward Speed
Maximum Reverse Speed
Minimum Reverse Speed
Maximum Turning Speed
Minimum Turning Speed
Maximum Forward Acceleration
Minimum Forward Acceleration
Maximum Forward Deceleration
Minimum Forward Deceleration
Maximum Reverse Acceleration
Minimum Reverse Acceleration
Maximum Reverse Deceleration
Minimum Reverse Deceleration
Maximum Turn Acceleration
Minimum Turn Acceleration
Maximum Turn Deceleration
Minimum Turn Deceleration
Power
Torque
Tremor Damping
Controls
Latched
Profile 1 Profile 2 Profile 3 Profile 4 Profile 5 Profile 6 Profile 7 Profile 8
Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6 Mode 7 Mode 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
25 % 50 % 80 % 100 % 60 % 60 % 60 % 40 %
10 % 10 % 10 % 25 % 10 % 10 % 10 % 10 %
20 % 30 % 40 % 50 % 30 % 30 % 30 % 25 %
10 % 10 % 10 % 10 % 10 % 10 % 10 % 10 %
15 % 15 % 15 % 15 % 15 % 15 % 15 % 10 %
5 % 5 % 5 % 5 % 5 % 5 % 5 % 5 %
20 20 20 20 20 20 20 20
10 10 10 10 10 10 10 10
25 35 45 55 35 35 35 35
25 25 25 25 25 25 25 25
20 20 20 20 20 20 20 20
10 10 10 10 10 10 10 10
20 30 40 40 30 30 30 30
20 20 20 20 20 20 20 20
15 15 15 15 15 15 15 15
10 10 10 10 10 10 10
Sets the braking rate whe
25 35 45 55 35 35 35 35
20 20 20 20 20 20 20 20
80 % 80 % 100 % 100 % 80 % 80 % 80 % 80 %
80 % 80 % 80 % 80 % 80 % 80 % 80 % 80 %
0 % 0 % 0 % 0 % 0 % 0 % 0 % 0 %
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant

Controls - Global

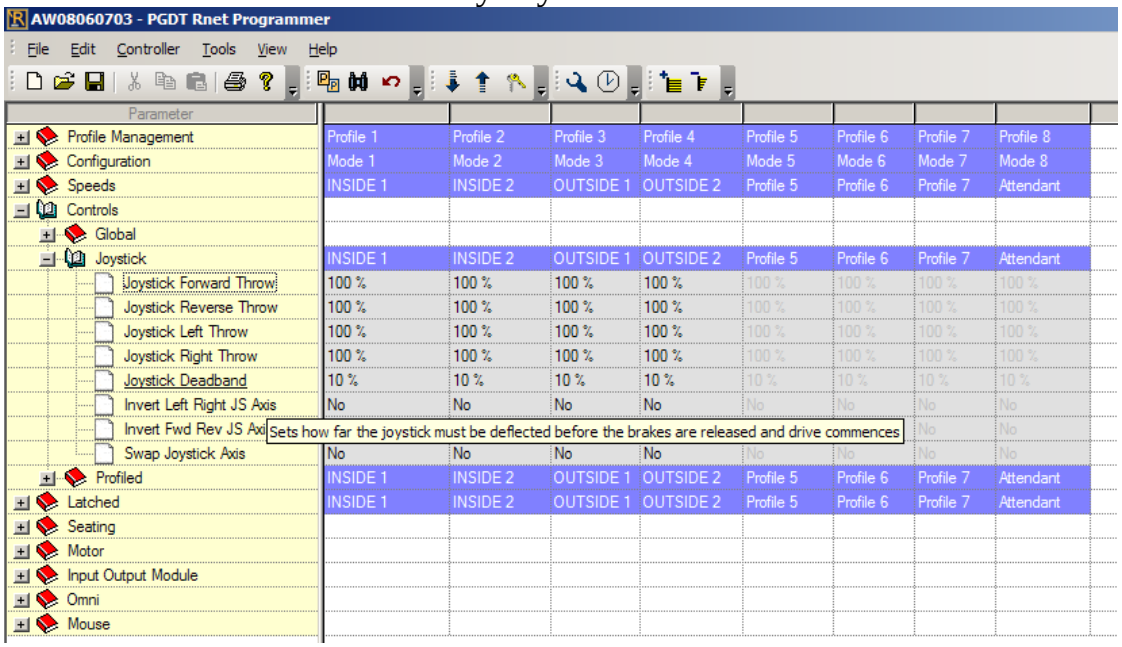


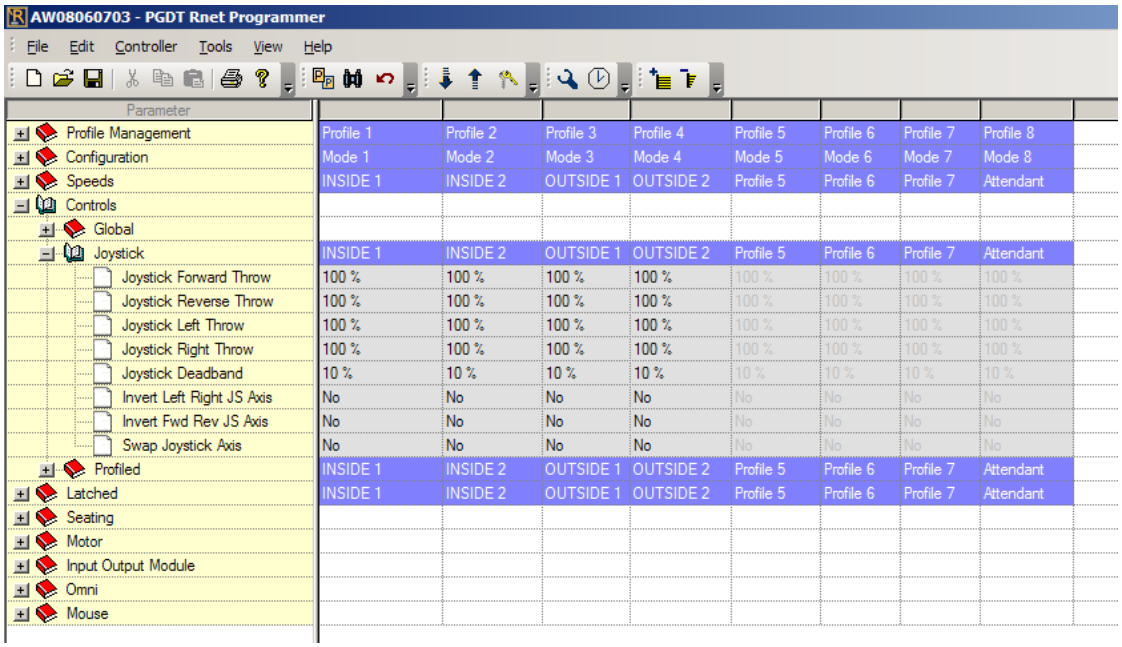


Lock Function: is enable by either Lock or Sequence – the lock is using a key while unit is powered up and inserting followed by pulling back out – Unlock same way by inserting and removing from Charger Port. Sequence done while unit is on Depress On/Off Key and give Driving device FWD and REV directions – to unlock Power On FWD and REV directions once again.

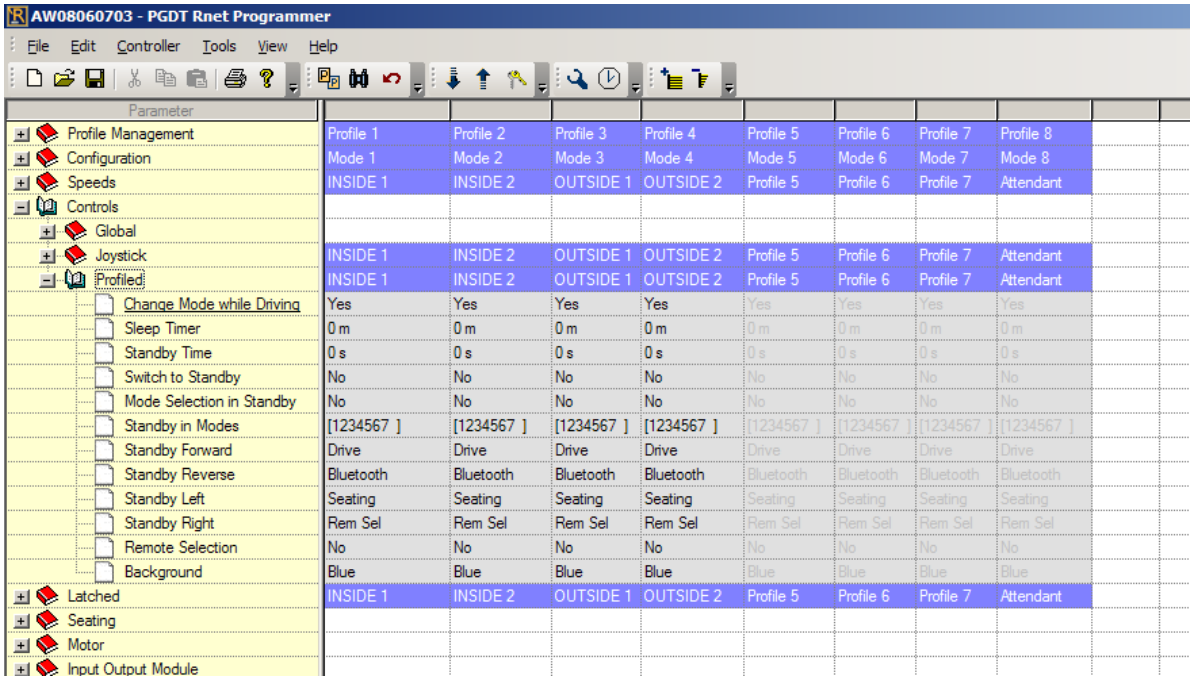


Joystick Settings – This sets up the individual Throw for the Customer in all 4 directions – Deadband – setting before control relay is engaged percentage setting – Invert Left or Right and Invert Forward and Reverse – choice of Yes or No – also Sway Joystick Axis does both Inverts.

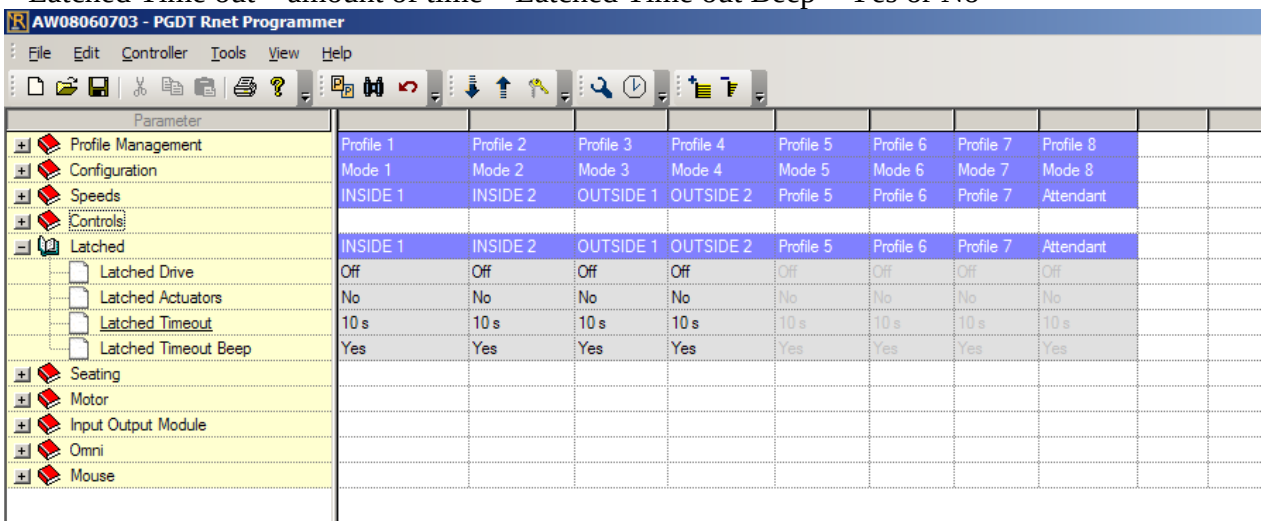

AW08060703 - PGDT Rnet Programmer
File Edit Controller Tools View Help
Parameter
Profile Management
Configuration
Speeds
Controls
Global
Joystick
Joystick Forward Throw
Joystick Reverse Throw
Joystick Left Throw
Joystick Right Throw
Joystick Deadband
Invert Left Right JS Axis
Invert Fwd Rev JS Axis
Swap Joystick Axis
Profiled
Latched
Seating
Motor
Input Output Module
Omni
Mouse
Profile 1 Profile 2 Profile 3 Profile 4 Profile 5 Profile 6 Profile 7 Profile 8
Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6 Mode 7 Mode 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
100 %
10 %
No
Sets how far the joystick must be deflected before the brakes are released and drive commences
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant



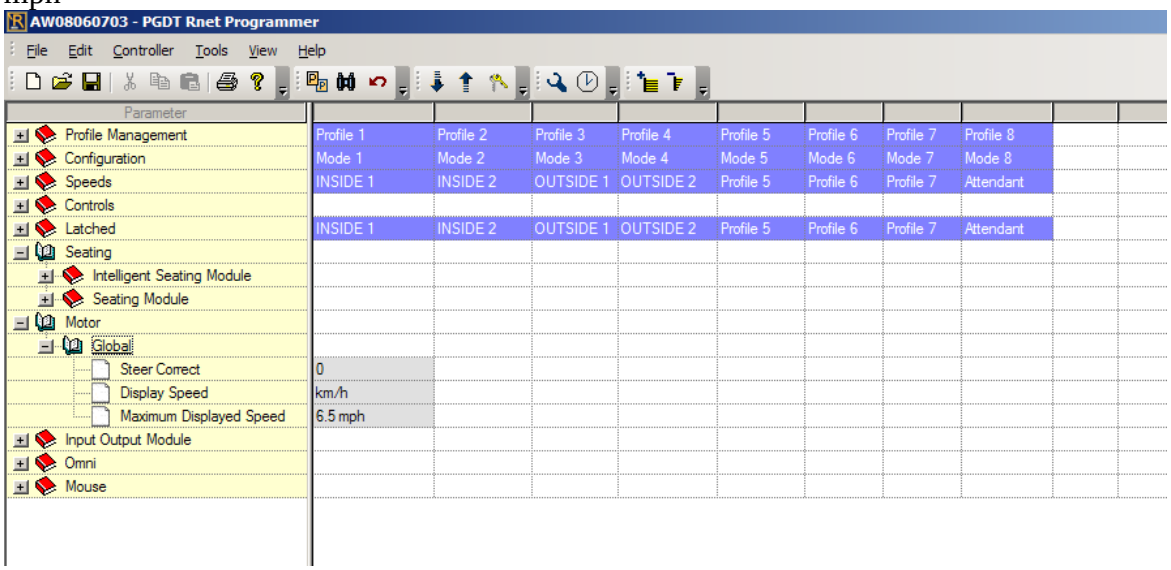
Profile setup – shows the Change Mode While Driving – Yes or No – Sleep timer – to activate put a time in minutes – Standby Time – add time to activate so that it activates after inactivity – Switch to Standby – Activate via switch – Yes or Not - Mode Selection in Standby – Yes or No – Then you have 4 choices for your 4 directions – Background – on a colour joystick decides whether you want Blue or White Background.



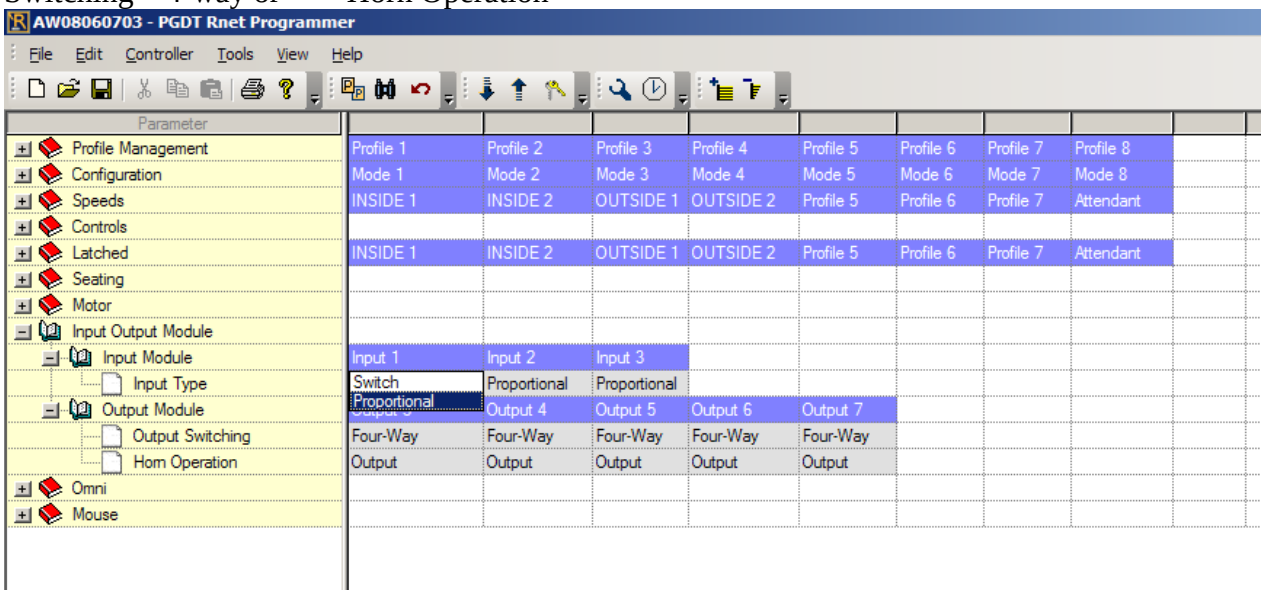
Latched - Shows choices of Profile – Latched Drive – Latched Actuators – Yes or No – Latched Time out – amount of time – Latched Time out Beep – Yes or No


AW08060703 - PGDT Rnet Programmer
File Edit Controller Tools View Help
Parameter
Profile Management
Configuration
Speeds
Controls
Latched
Latched Drive
Latched Actuators
Latched Timeout
Latched Timeout Beep
Seating
Motor
Input Output Module
Omni
Mouse
Profile 1 Profile 2 Profile 3 Profile 4 Profile 5 Profile 6 Profile 7 Profile 8
Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6 Mode 7 Mode 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
Off Off Off Off Off Off Off Off
No No No No No No No No
10 s 10 s 10 s 10 s 10 s 10 s 10 s 10 s
Yes Yes Yes Yes Yes Yes Yes Yes

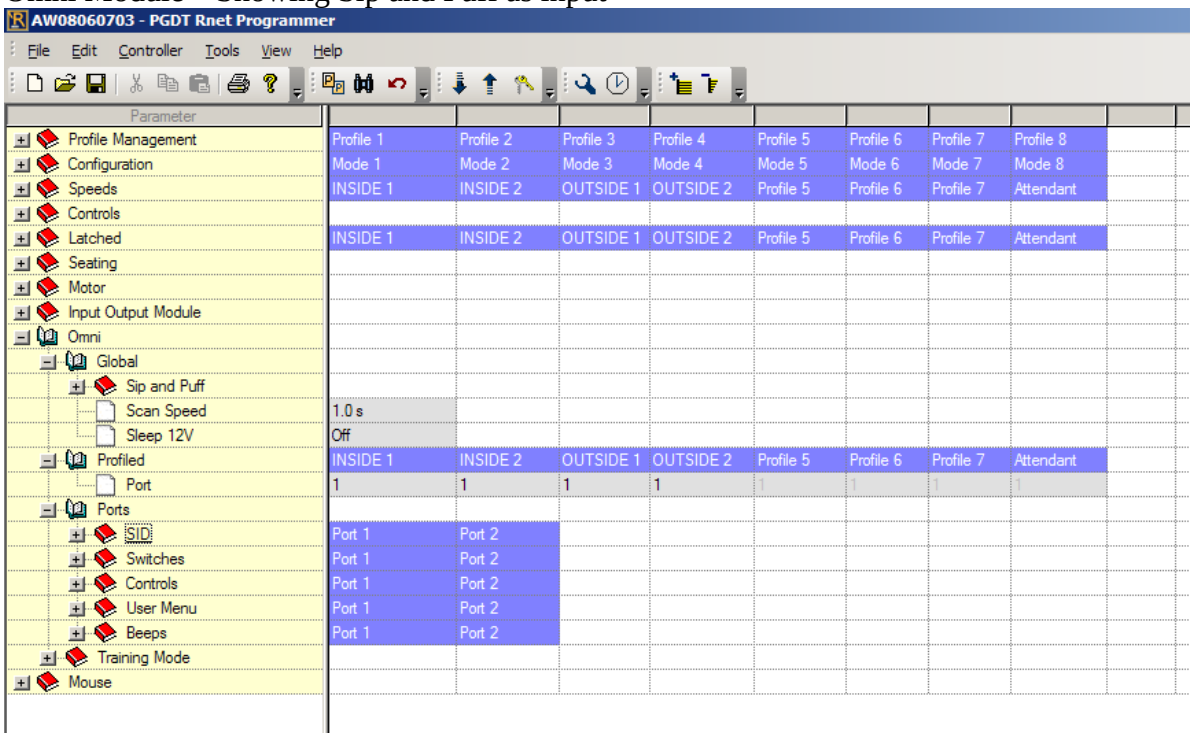
Motor – Picture below details that you can adjust Steer Correct – Display Speed whether it is MPH or Kilometers – also the Maximum Speed displayed – example is 6.5 mph


AW08060703 - PGDT Rnet Programmer
File Edit Controller Tools View Help
Parameter
Profile Management
Configuration
Speeds
Controls
Latched
Seating
Intelligent Seating Module
Seating Module
Motor
Global
Steer Correct
Display Speed
Maximum Displayed Speed
Input Output Module
Omni
Mouse
Profile 1 Profile 2 Profile 3 Profile 4 Profile 5 Profile 6 Profile 7 Profile 8
Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6 Mode 7 Mode 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
0
km/h
6.5 mph

Input / Output – Shows choice of Switch or Proportional as Input Choice – Output Switching – 4-way or - Horn Operation


AW08060703 - PGDT Rnet Programmer
File Edit Controller Tools View Help
Parameter
Profile Management
Configuration
Speeds
Controls
Latched
Seating
Motor
Input Output Module
Input Module
Input Type
Output Module
Output Switching
Horn Operation
Omni
Mouse
Profile 1 Profile 2 Profile 3 Profile 4 Profile 5 Profile 6 Profile 7 Profile 8
Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6 Mode 7 Mode 8
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
INSIDE 1 INSIDE 2 OUTSIDE 1 OUTSIDE 2 Profile 5 Profile 6 Profile 7 Attendant
Input 1 Input 2 Input 3
Switch Proportional Proportional
Proportional
Output 4 Output 5 Output 6 Output 7
Four-Way Four-Way Four-Way Four-Way Four-Way
Output Output Output Output Output

Omni Module – Showing Sip and Puff as input



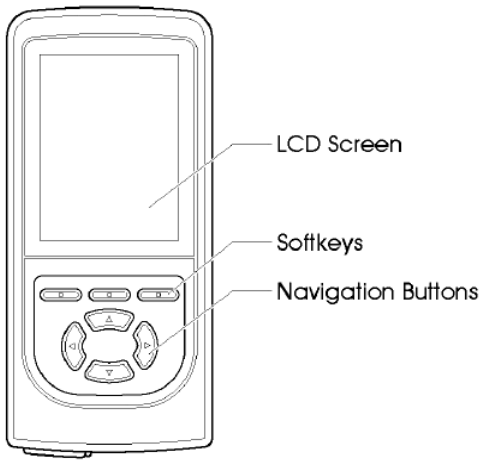
Diagnostic Test Tool (DTT)

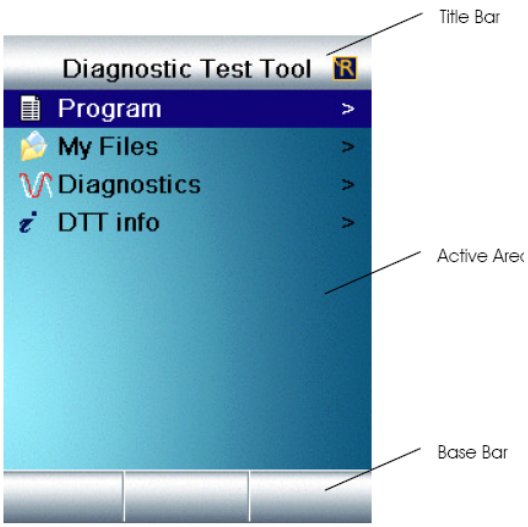
- The DTT is capable of performing nearly every task that is performed by the PC Programmer.

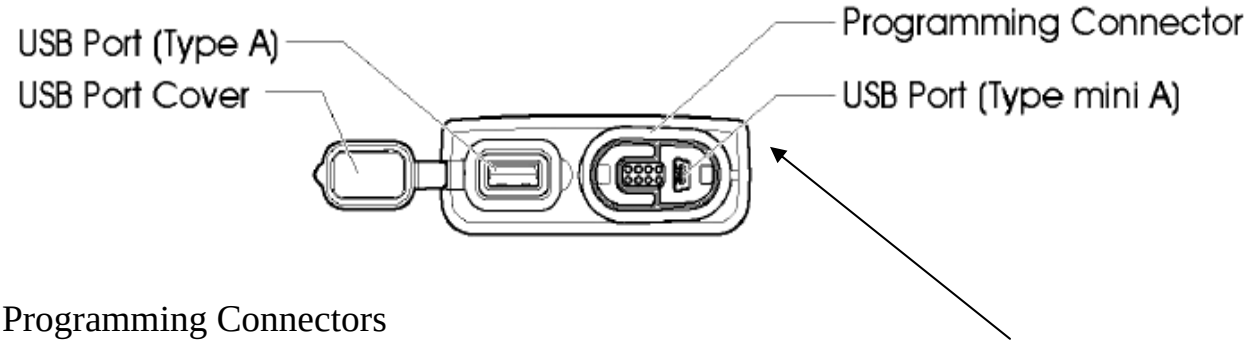
Including:

- Programming most parameters,
- Diagnostics.
- File saving (USB port for flash memory)
- Real-Time measurement of critical wheelchair voltages and currents,
- State of all actuator-limit, speed reduction and speed-limiting switches and..
- Also capable of accessing all seating functions.

DTT – Diagnostic Test Tool



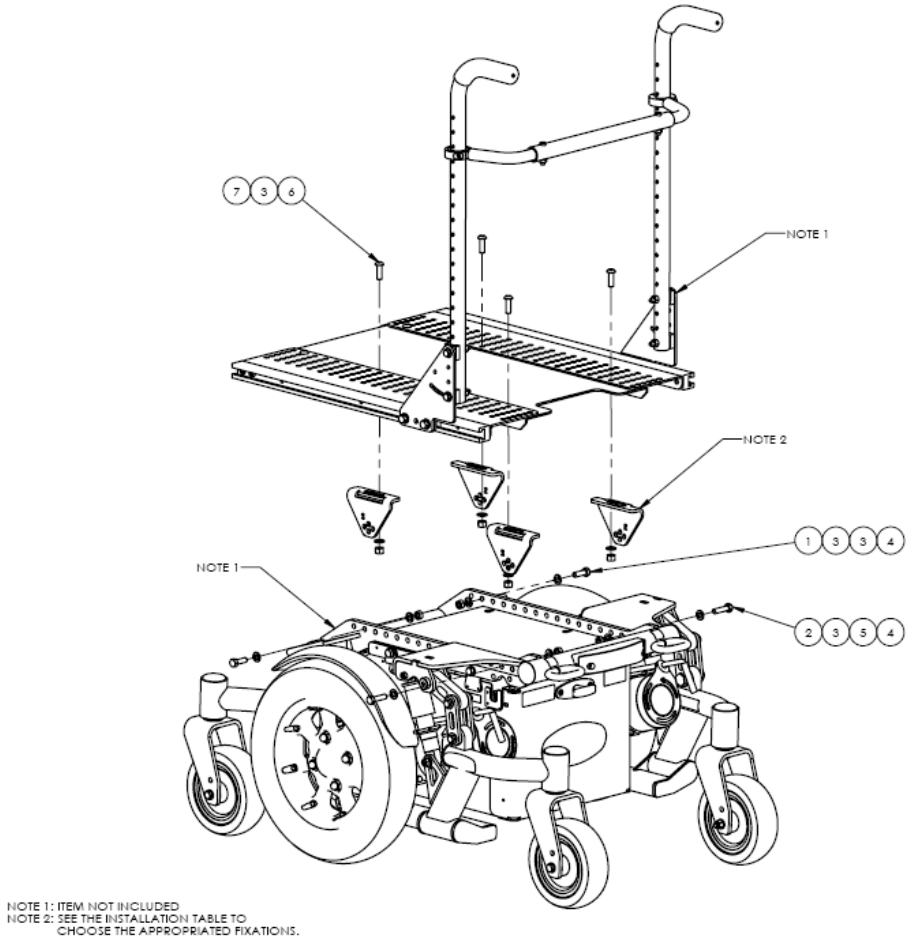




Programming Connectors

USB Port – Connects directly to computer and comes up as another Drive.

Seating Section

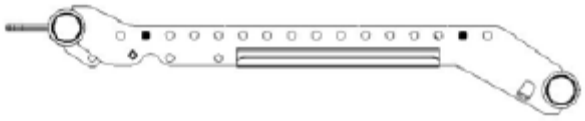

7 3 6
NOTE 1
NOTE 2
1 3 3 4
NOTE 1
2 3 5 4
NOTE 1: ITEM NOT INCLUDED
NOTE 2: SEE THE INSTALLATION TABLE TO CHOOSE THE APPROPRIATED FIXATIONS.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	E00158	5/16-18 X 1" GR5 BZ HEX BOLT	2
2	E00169	5/16-18 X 1-1/4" HEX BOLT GR5 BZ	2
3	E00041	FLAT WASHER 5/16" SAE BZ	11
4	E00028	NYLON LOCK NUT .312-18 THIN	4
5	E00041	5/16" RONDELLE BZ	1
6	E00199	5/16-18 X 1" BUTTON HEAD SOCKET CAP SCREW BZ	4
7	E00027	NYLON LOCK NUT 5/16-18 BZ	4

The parts and picture above show the position of where the brackets will be mounted on seating without Power Options. On the next page shows more details to this followed by a few pages describing what is necessary to achieve different Seat to floor heights.

The first part to learn is about the Fixation Settings

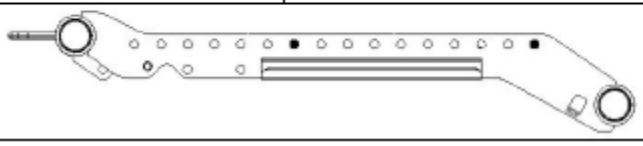
Please look at picture below:

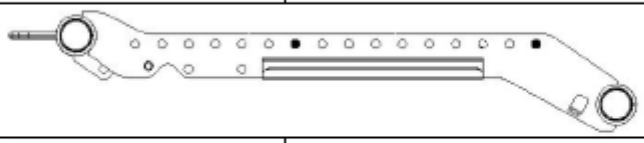
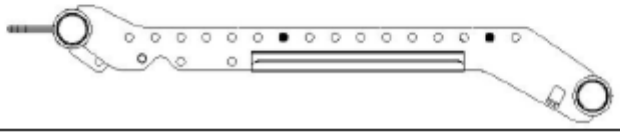
INSTALLATION TABLE (SEE PAGES 4.5.9 À 4.5.19)		
STFH (1)	REAR (3)	FRONT (3)
ANGLE (2)		
(4) 		
1- CHOOSE THE SEAT TO FLOOR HIGHT (STFH) 2- CHOOSE THE ANGLE 3- LOCATE THE HOLES ON REAR AND FRONT FIXATIONS 4- LOCATE THE POSITIONNING HOLES ON THE STRUCTURE 5- SELECT THE APPROPRIATED FIXATION ON THE FIXATION # TABLE		

(5) FIXATIONS NUMBER TABLE	
FIXATION #	AMYSYSTEMS #
1	A1065
2	A1066
3	A1067
4	A1068
5	A1069
6	A1070
7	A1071
8	A1072

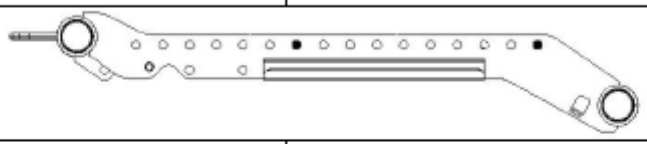
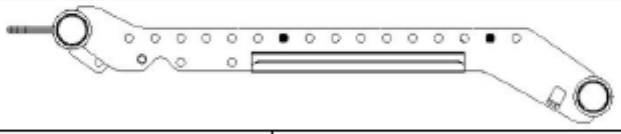
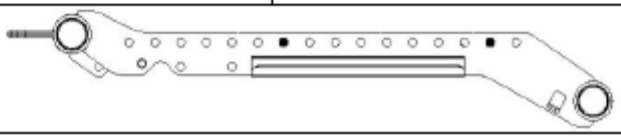
You will see there are 4 different settings for front and rear which If you add to together equal 8 arrangement but is actually 4^2

The first group of setups will be for 19” seat depth for either Xplore or Xperience.

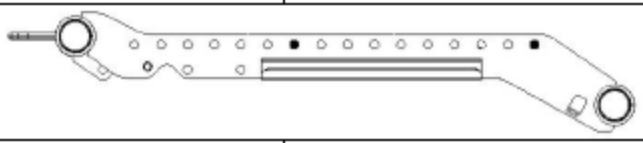
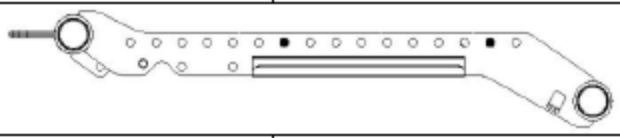
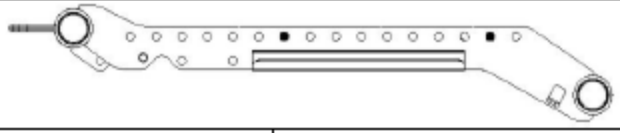
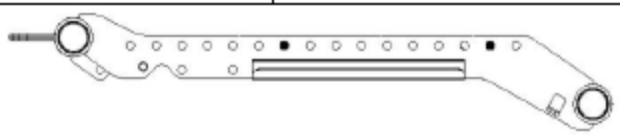
STFH 16.375	REAR FIXATION	FRONT FIXATION
0 DEG	#1	#1
		

STFH 17.50	REAR FIXATION	FRONT FIXATION
0 DEG	#2	#2
		
3 DEG	#1	#2
		

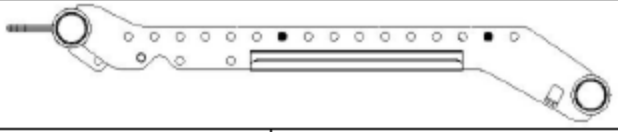
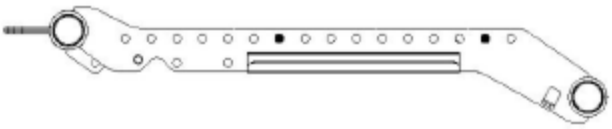
Once you go above 17.50 inches you have more variety of angles
From 0 to 6 degrees on 18” seat to floor

STFH 18.00	REAR FIXATION	FRONT FIXATION
0 DEG	#3	#3
		
3 DEG	#2	#3
		
6 DEG	#1	#2
		

Even further setting of seat angle as we go to 18.75 for 0 to 9 degrees.

STFH 18.75	REAR FIXATION	FRONT FIXATION
0 DEG	#4	#4
		
3 DEG	#3	#4
		
6 DEG	#2	#3
		
9 DEG	#1	#3
		

The next height is 19.375 and once again offers the 0 to 9 degrees of changes in seat settings.

STFH 19.375	REAR FIXATION	FRONT FIXATION
0 DEG	#5	#5
3 DEG	#4	#5
6 DEG	#3	#4
		
9 DEG	#2	#4
		

The seat setting can be adjusted even further to 20 – 21.25 and achieve angles up to 12 and 15 degree's.

All of these settings are done with the combination of Drive wheel types of 14" and the arrangement of front caster sizes of 6 – 8 or 9 inch depending on chair type.

Note: Remember the Xperience has a choice of 6 or 8 inch casters and the Xplore has a choice of 8 or 9 inch casters.

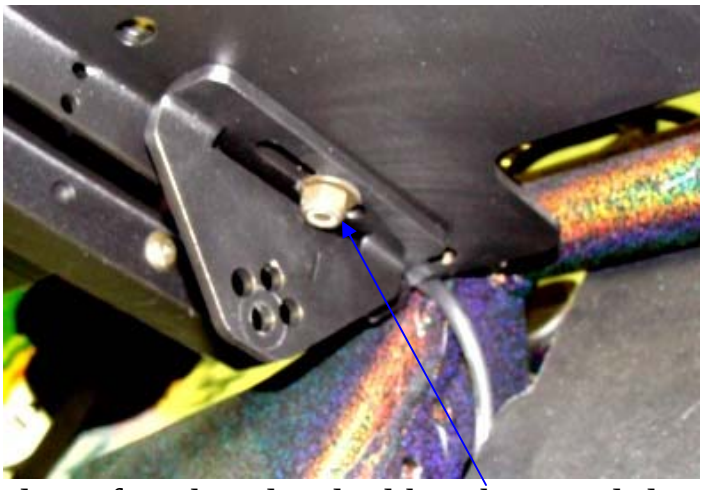
Below is pictorial view of actual brackets and how they are manipulated to set proper seating:

Shows 4 hole arrangement

Shows front mount setting top hole

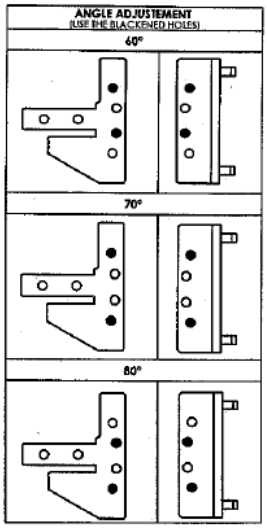
Ratchet 7/16” bolts and nut

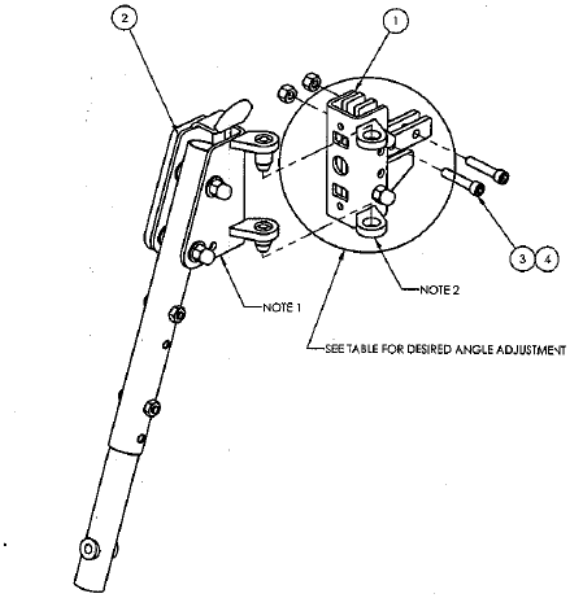
View of all 4 brackets mounted

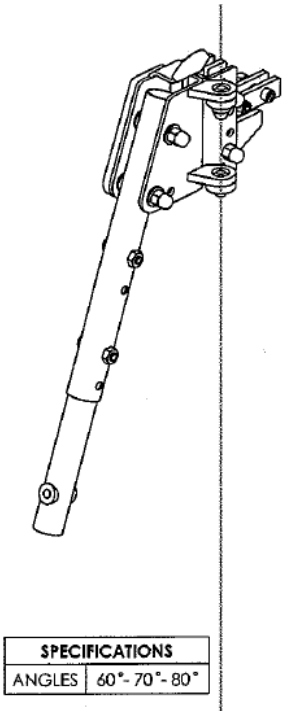


Adjustability of each individual bracket on slide piece

Setting the angles on your Footrest 60 – 70 – and 80 degrees

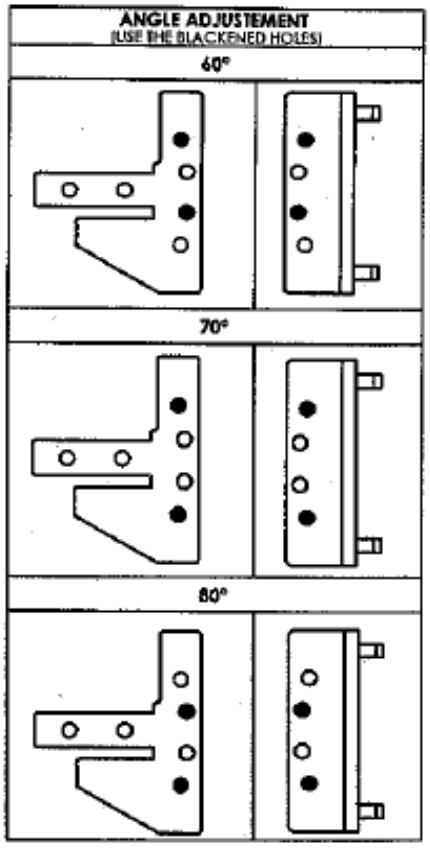






SPECIFICATIONS	
ANGLES	60°- 70°- 80°

Indicator shown in a little larger context seen below:



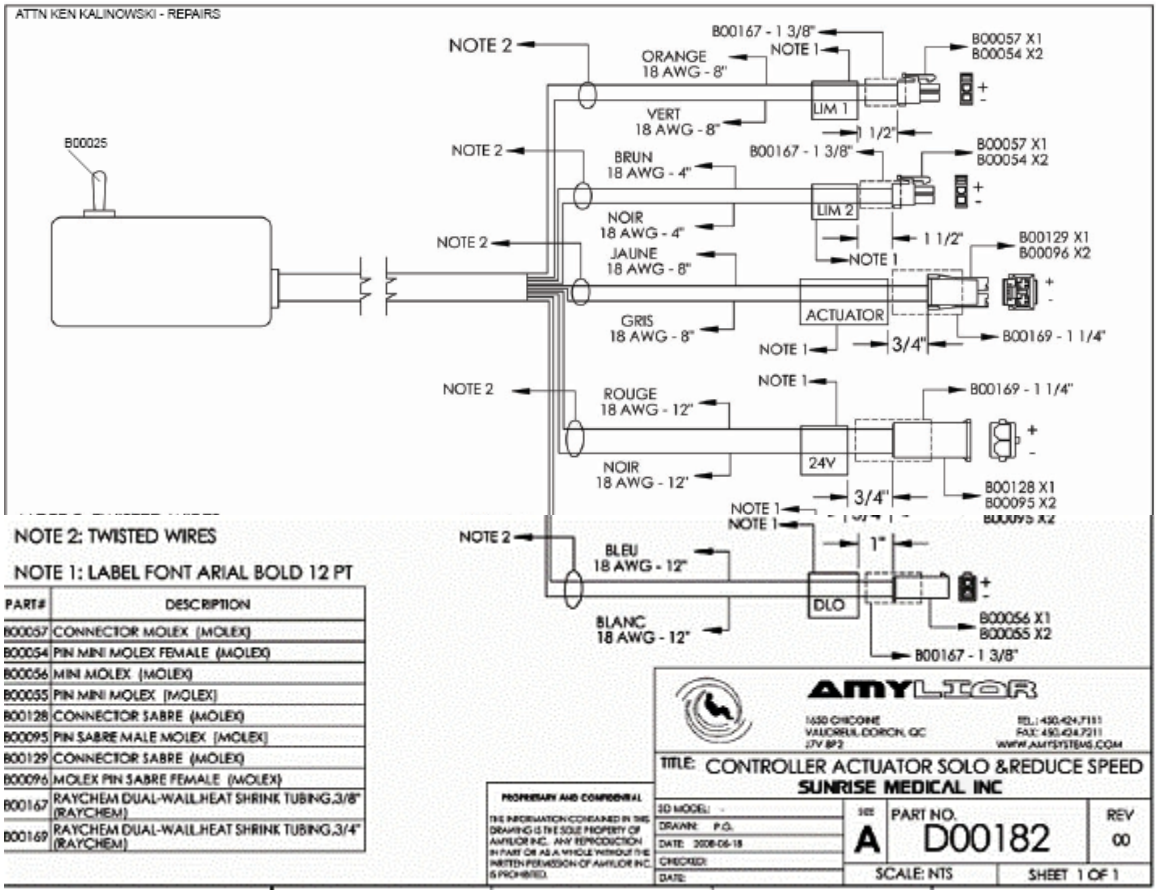
Single Switch or ISM – Lockout and Decreased Drive Setting

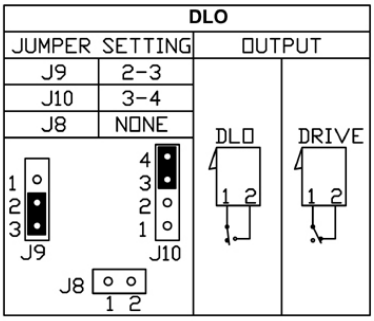
Shorted Normal Drive
120 Ω Reduced Speed 25%
Opened Drive Lock out

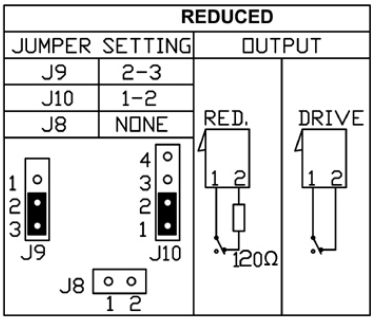
The Solo and Duo, for now, needs to be programmed to either output DLO or REDUCED SPEED.

For Inhibit #4, on the ISM, it goes like this:

Shorted Normal Drive
4.7 K Ω Reduced Speed 25% and TILT Inhibit
Opened Drive Lock out and LIFT Inhibit







R-Net Seating Controls

SAC – Single Actuator Control
"New" unit as of Oct. 01-2009

Figure 1 - SAC box

Figure 2 - SAC box internal

The SAC box is a single actuator control which has all channels tied together so whether hooking up a Tilt – Recline – Left Leg – Right Leg – and or Elevate – it will see this.

Figure 2 shows the internal of the SAC box and the RED dip Switches are normally set to OFF as depicted in the wiring diagrams of the parts manual.

DIP SWITCH	
DIP 1	OFF
DIP 2	OFF
DIP 3	OFF
DIP 4	OFF

The upper left corner of the picture depicts the jumpers internal for the setup of what type of system is used – inside plate will eventually be changed but for now we follow for our chairs the same as MK6 for jumper settings depicted on Figure 3 next page.

Figure 3

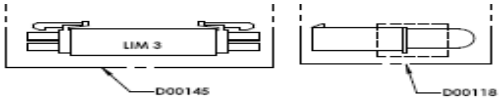
The cover listing jumper settings

(note: we use MK6 on the Xplore – Xperience – 323)

Serial Number designation is year and month

On limit switch inputs there are 3 Settings

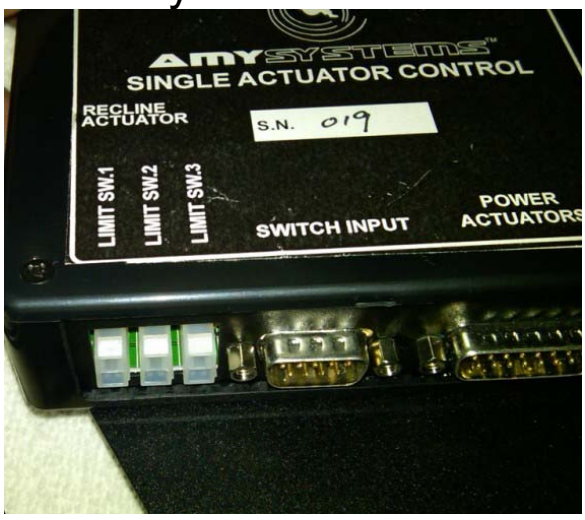
(*note: if not Limit used must used D00118 jumper and D00145)*



Limit 1 – DLO – or Drive lock out

Limit 2 – Lock out &

Limit 3 – Mercury Switch



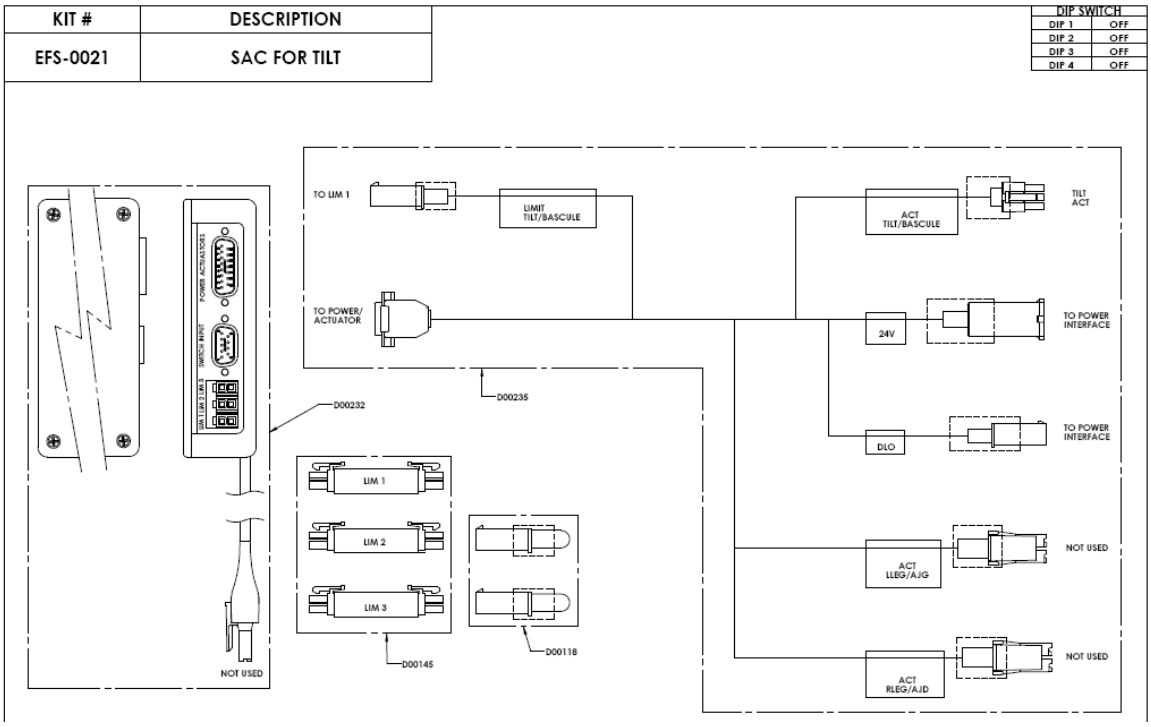
DAC – Dual Actuator Control

Figure 4

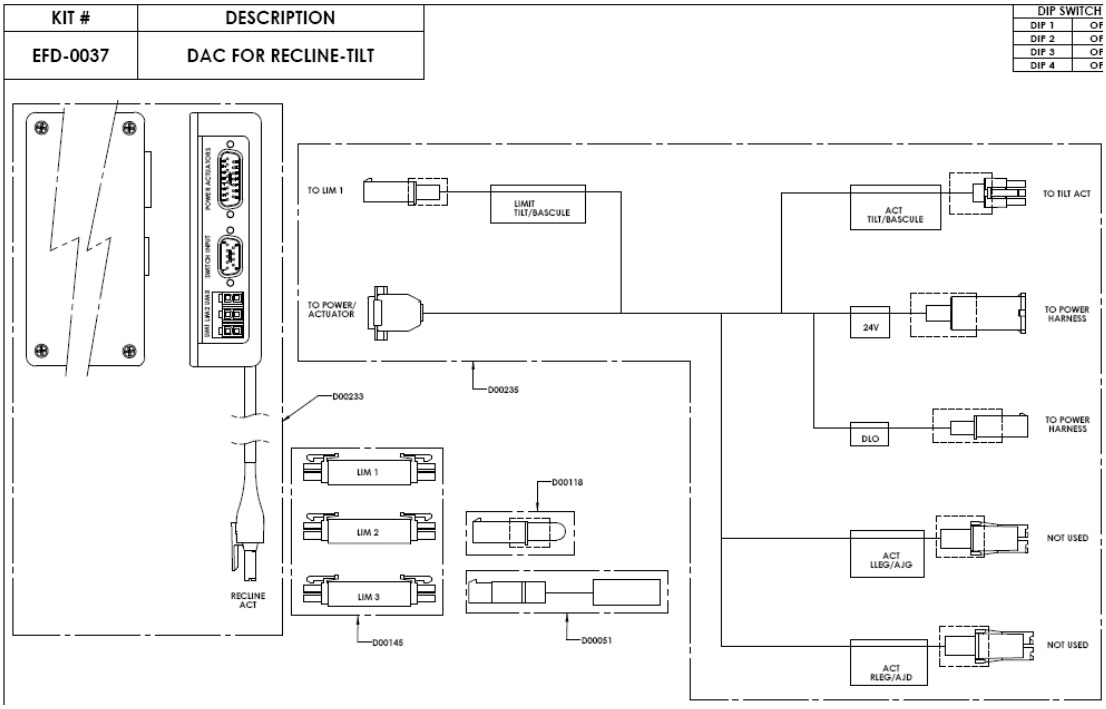
Figure 4 - depicting the Dual Actuator control the input lines as mentioned on the preceding page this time has one line dedicated to Tilt – and then ties the other lines together for the other actuator to be chosen – recline tilt – lift etc.

One of the things nice about these new control devices is that you can stay with the same wiring if you are not making any changes to the seating. Example if you have Tilt already and decided to change from SAC to DAC it is a matter of just switching the boxes and this is the idea of the new Electronics to make it easy to change out.

2 diagrams of the wiring for SAC and DAC

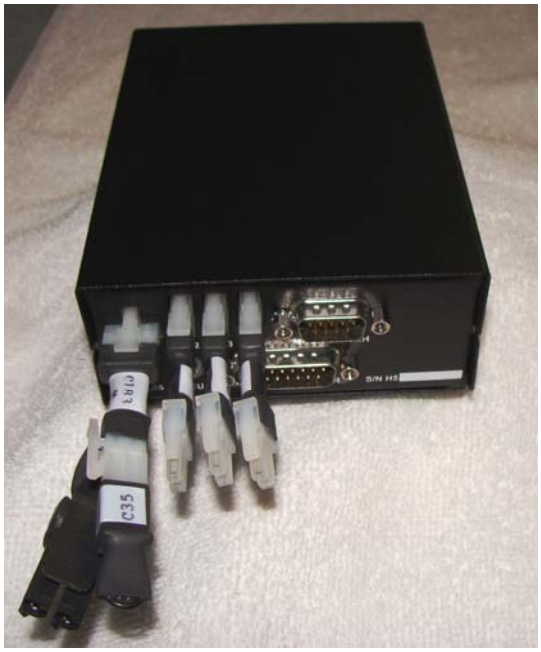


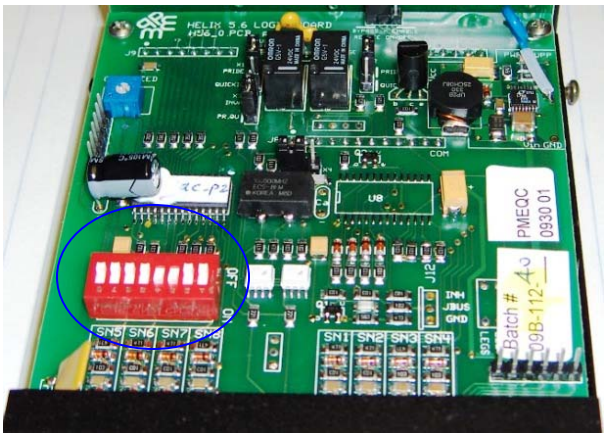
You will notice 3 things on this diagram a Kit # is always on left corner - showing the complete parts for a SAC to work with Tilt – the wiring showing a complete connection with depiction to actuator and inhibits – and finally the top right corner showing the DIP switch Settings.



You will see on this one we are using the same cable D00235 but we are using the cable control to the Recline actuator.

MAC – Multi Actuator Control

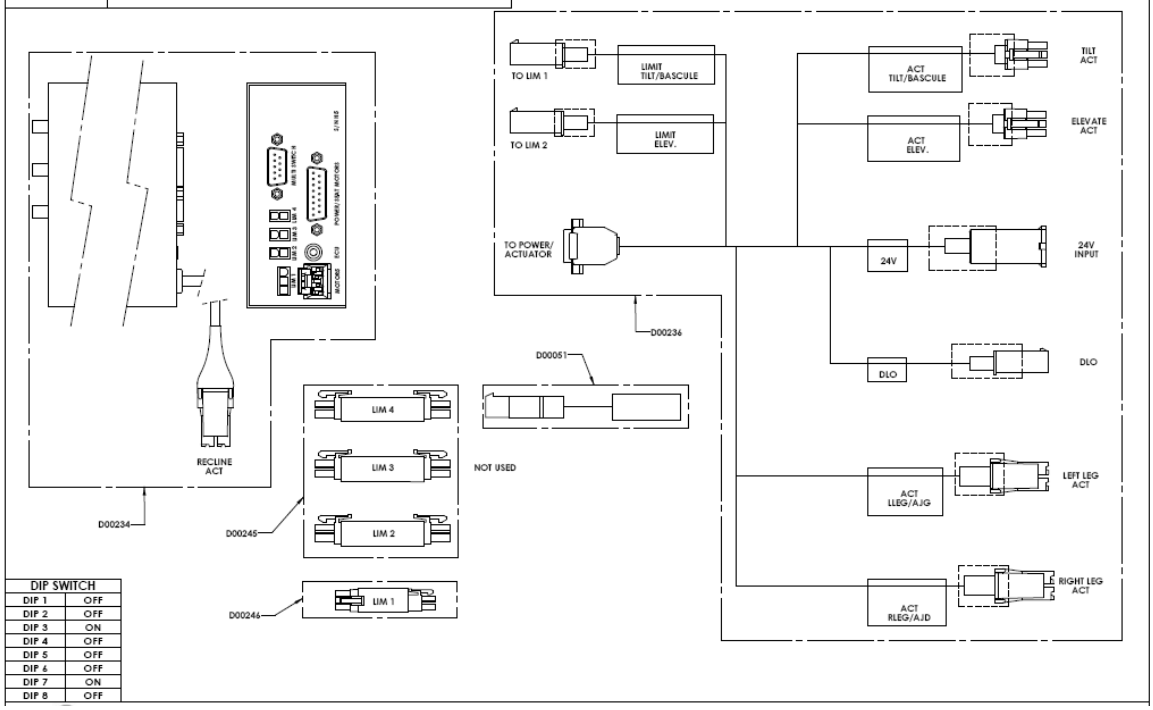




Showing limit adaptor D00146 & 145 - Above is Dip Switch selector

The multi actuator control is just that it allows up to 5 actuators to work on. It has an internal Dip Switch that allows variation of operation of Seating.
Included below from Parts Manual is the

KIT #	DESCRIPTION
EFM-0003	MAC FOR TILT-RECLINE-LLEG-RLEG-ELEVATE



DIP SWITCH	
DIP 1	OFF
DIP 2	OFF
DIP 3	ON
DIP 4	OFF
DIP 5	OFF
DIP 6	OFF
DIP 7	ON
DIP 8	OFF

The above gives the kit # in left corner wiring diagram to the center and left and the Dip Switch selection on these are found on the bottom left of the page.

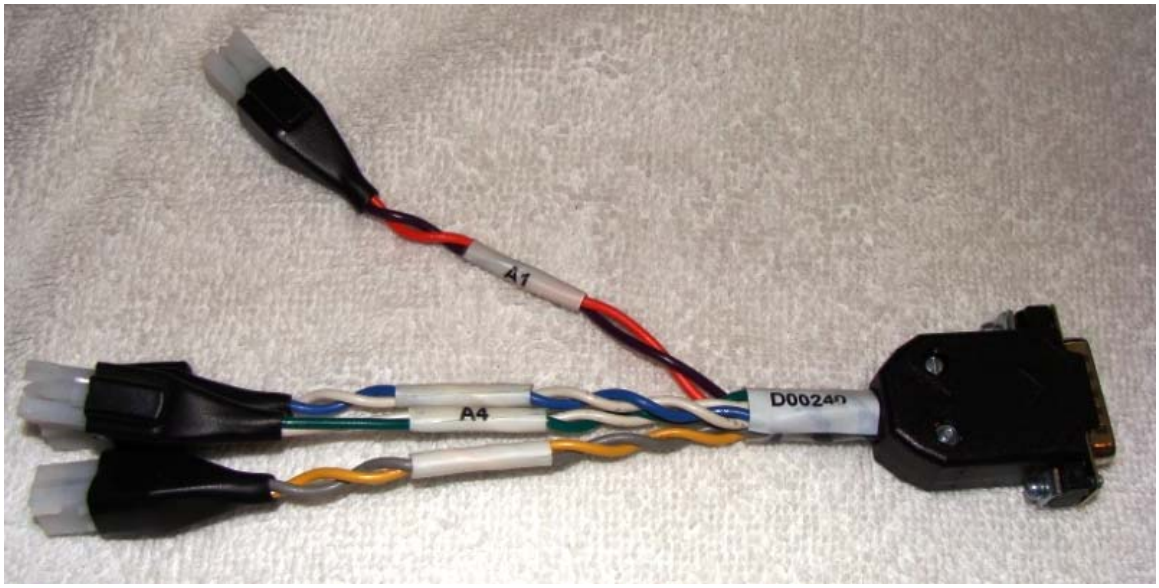
Below is the operation if using a Triple Switch and the settings for MAC:

Switch 1 fwd will do function 1 in toggle mode
Switch 1 back will do function 2 in toggle mode
Switch 2 fwd will do function 3 in toggle mode
Switch 2 back will do function 4 in toggle mode
Switch 3 fwd will do function 5 in toggle mode
Switch 3 back will do nothing

The Function - this is standard for MAC

1 tilt
2 recline
3 left leg
4 right leg
5 legs simultaneous (replaced by elevate when on system)

Below is shown the adaptor to allow actuator inputs into the MAC control box:



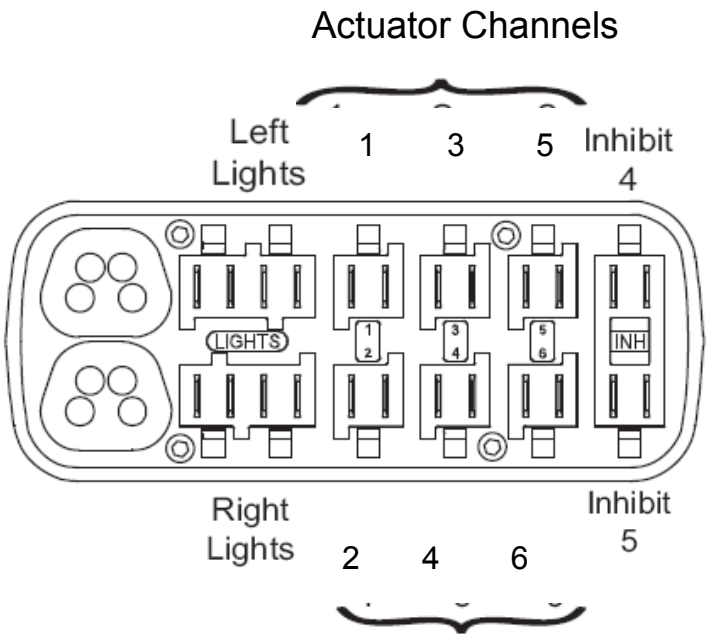
The lettering A followed by a number follows the function chart shown above and this channel selecting stays the same with Drive Through Operation as well.

I.S.M. – Intelligent Seating Module

There are 3 different types of Seating Controls

2 output – 4 output – 6 output

This is totally depending on the need for drive through operation.



Switches for New Electronics – Oct 01- 2009

Single Toggle Switch – Part number D00251

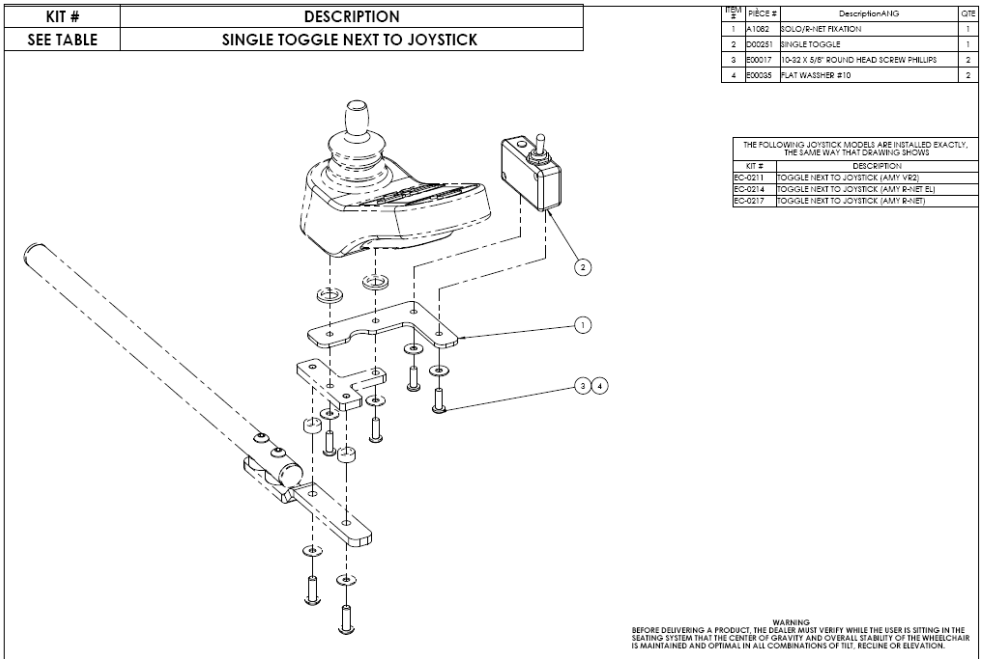
This switch has LED to indicate Drive – Drive inhibit and Drive lockout – it has the common 9 pin Sub- D Connection to work on all the Control boxes except the ISM.

Operation is as follows:

Green - Drive operation

Red - Drive lockout and Elevate Inhibit

Flashing Red/Green – Drive Inhibit and Tilt Inhibit


KIT #
DESCRIPTION
SEE TABLE
SINGLE TOGGLE NEXT TO JOYSTICK
ITEM #
PIÈCE #
DescriptionANG
QTÉ
1 A1082 SOLO/R-NET FIXATION 1
2 D00251 SINGLE TOGGLE 1
3 E00017 10-32 X 5/8" ROUND HEAD SCREW PHILLIPS 2
4 E00035 FLAT WASSHER #10 2
THE FOLLOWING JOYSTICK MODELS ARE INSTALLED EXACTLY, THE SAME WAY THAT DRAWING SHOWS
KIT #
DESCRIPTION
EC-0211 TOGGLE NEXT TO JOYSTICK (AMY VR2)
EC-0214 TOGGLE NEXT TO JOYSTICK (AMY R-NET EL)
EC-0217 TOGGLE NEXT TO JOYSTICK (AMY R-NET)
WARNING
BEFORE DELIVERING A PRODUCT, THE DEALER MUST VERIFY WHILE THE USER IS SITTING IN THE SEATING SYSTEM THAT THE CENTER OF GRAVITY AND OVERALL STABILITY OF THE WHEELCHAIR IS MAINTAINED AND OPTIMAL IN ALL COMBINATIONS OF TILT, RECLINE OR ELEVATION.

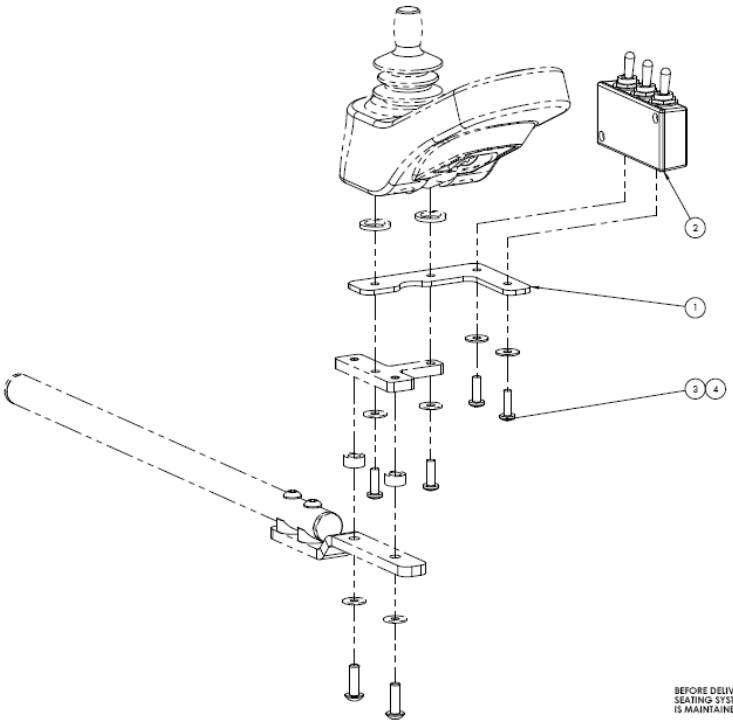
Triple Toggle Switch – Part # D00252

The operation of LED is the same but the combinations of Switch is controlled by setting of Xoxoxo which can be changed.

KIT #	DESCRIPTION
SEE TABLE	TRIPPLE TOGGLE NEXT TO JOYSTICK

ITEM #	PART #	DESCRIPTION	QTY
1	A1082	SOLO/R-NET FIXATION	1
2	D00252	TRIPPLE TOGGLE	1
3	B00017	10-32 X 5/8" ROUND HEAD SCREW PHILLIPS	2
4	B00035	FLAT WASSHER #10	2

THE FOLLOWING JOYSTICK MODELS ARE INSTALLED, EXACTLY, THE SAME WAY THAT DRAWING SHOWS	
KIT #	DESCRIPTION
EC-0213	TRIPPLE TOGGLE NEXT TO JOYSTICK (AMY VR2)
EC-2016	TRIPPLE TOGGLE NEXT TO JOYSTICK (AMY R-NET EL)
EC-0219	TRIPPLE TOGGLE NEXT TO JOYSTICK (AMY R-NET)



WARNING
BEFORE DELIVERING A PRODUCT, THE DEALER MUST VERIFY WHILE THE USER IS SITTING IN THE SEATING SYSTEM THAT THE CENTER OF GRAVITY AND OVERALL STABILITY OF THE WHEELCHAIR IS MAINTAINED AND OPTIMAL IN ALL COMBINATIONS OF TILT, RECLINE OR ELEVATION.

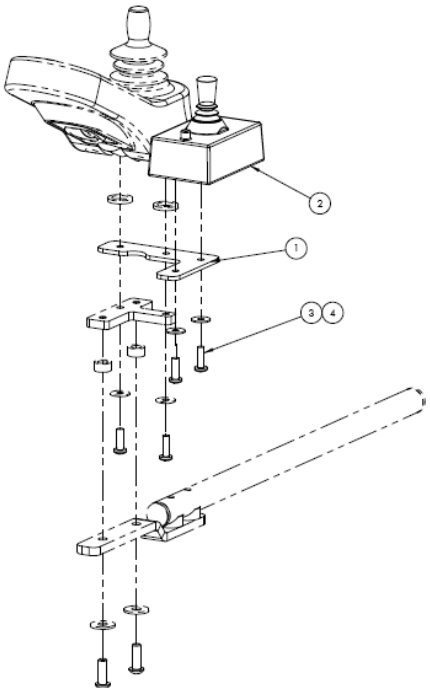
4 way Toggle – Part # D00034

4-way switch operation commonly set as Tilt – Recline – Left Legrest and Right Legrest – mounting and serial number shown as well as mounting holes.

KIT #	DESCRIPTION
SEE TABLE	4-WAY TOGGLE NEXT TO JOYSTICK

ITEM #	PART #	DESCRIPTION
1	A1082	SOLO/R-NET FIXATION
2	D00034	M26 MULTI-ACCESSORY SWITCHBOX
3	E00017	10-32 X 5/8" ROUND HEAD SCREW PHILLIPS
4	E00035	FLAT WASSHER #10

THE FOLLOWING JOYSTICK MODELS ARE INSTALLED, EXACTLY, T SAME WAY THAT DRAWING SHOWS	
KIT #	DESCRIPTION
EC-0212	4-WAY TOGGLE NEXT TO JOYSTICK (AMY VR2)
EC-0215	4-WAY TOGGLE NEXT TO JOYSTICK (AMY R-NET EL)
EC-0218	4-WAY TOGGLE NEXT TO JOYSTICK (AMY R-NET)



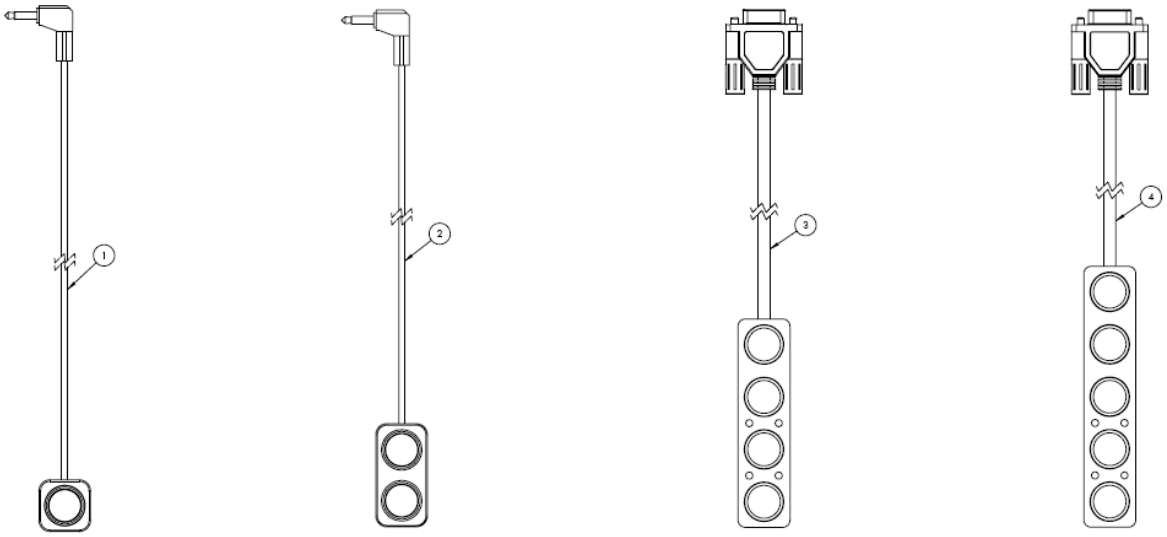
WARNING

Single Pushbutton Switches (various switches)

Above is shown switch D00253 – it connects to the controls and will depict all Technical Details!

Here is the table for part numbers taken from Parts Catalogue:

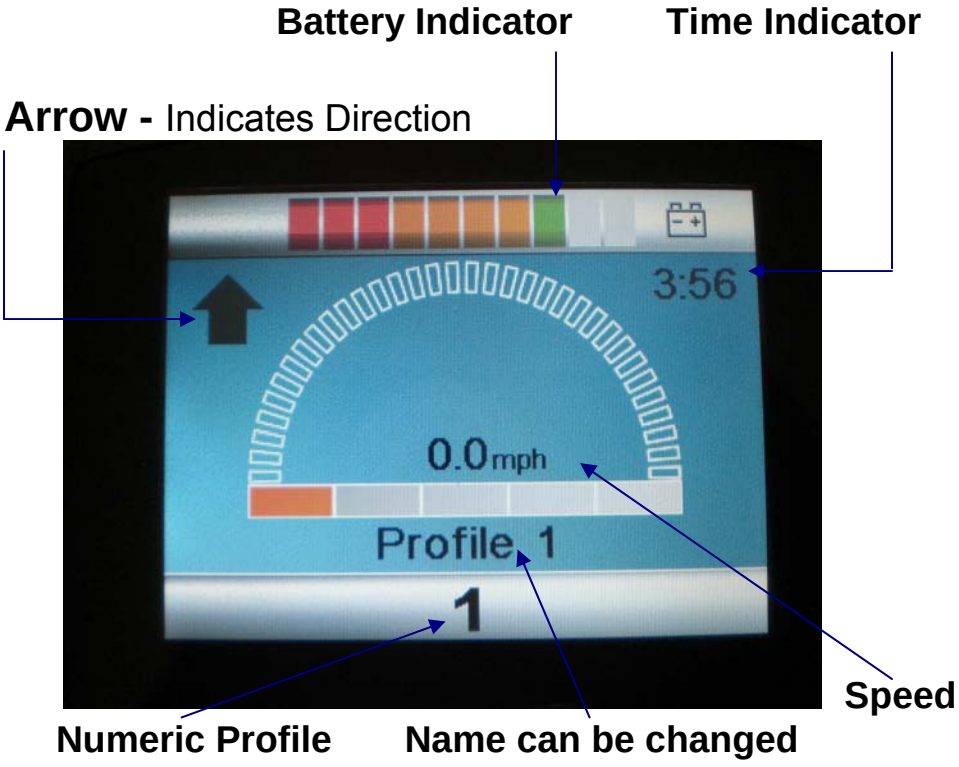
ITEM #	KIT #	DESCRIPTION	# OF THE PUSH BUTTON SWITCH
1	EC-0220	SINGLE PUSH BUTTON SWITCH USER MOUNTED	D00082
2	EC-0221	DUAL PUSH BUTTON SWITCH USER MOUNTED	D00091
3	EC-0222	4 PUSH BUTTON SWITCH USER MOUNTED	D00083
4	EC-0223	5 PUSH BUTTON SWITCH USER MOUNTED	D00253



Specialty Control Section

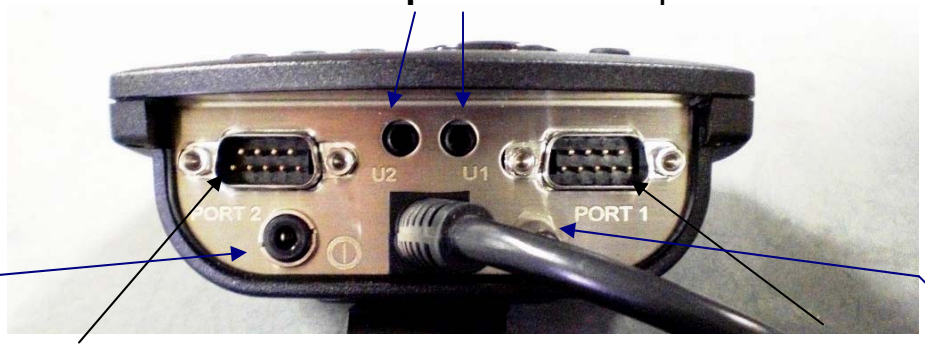
Features:

- General R-net interface for specialty controls
- Large, hi-resolution color display
- Dual channel inputs
- User selectable display - indoors/outdoors
- Customisable user menu
- Large, easy-to-read icons
- Programmable user text
- On-board configuration/programming
- Use standalone or with other R-net Input Devices
- Can control all powerchair functions



Input Description

U1 and U2 Switch Inputs – Mode Operation



Sip & Puff input

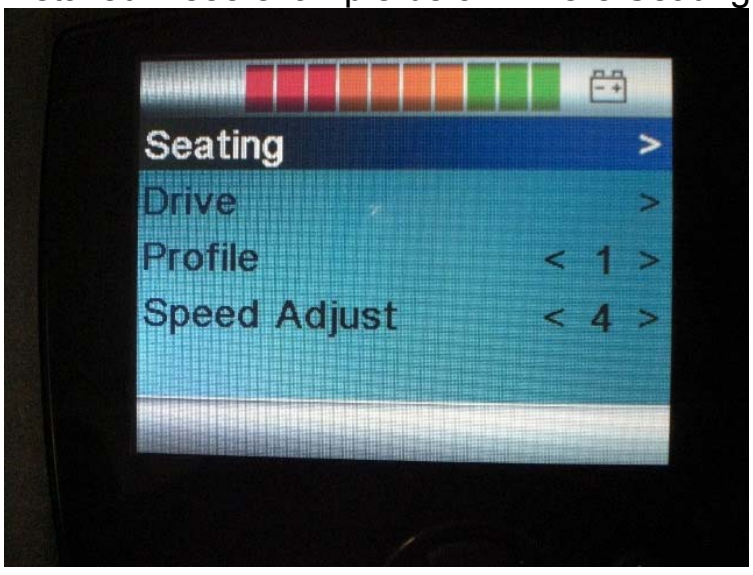
2 Inputs for either Switched or Proportional - Labeled as Port 1 and Port 2

On/ Off Port – Located below Port 2

Description of Input Connections

9 way D-Style Connector – SID connectors – Labeled as Port 1 and Port 2 – individual connections for either Proportional or Digital SID's (Switch Input Devices) – It can pick up whether connector is connected or not and also have provision for low current Power Supply in units used.

User Switch Jacks – There are 2 – 3.5 mm 1/8" jacks which provide connection to a user operated Mode change to what is installed – see example below where Seating is installed additionally



Sip & Puff Input – This input will accept a 3.5 mm – 1/8” pipe connected to Sip & Puff mouthpiece.

On/Off Port – Available for user in either Port to operate remotely via a Switch with1/8” jack to operate On/Off.

Sound/Beep Indicator

Charger Port

2 Bolt Mounting

Using old style mounting from USCM

Charger Input – 3 pin socket used to charge wheelchair and with System programming can be used to Lock out chair as well.

Control and its Operational Buttons

Description of Display and Front Buttons

LCD Screen – A full colour, backlit LCD screen that can show configuration details and operating information to both dealer and user.

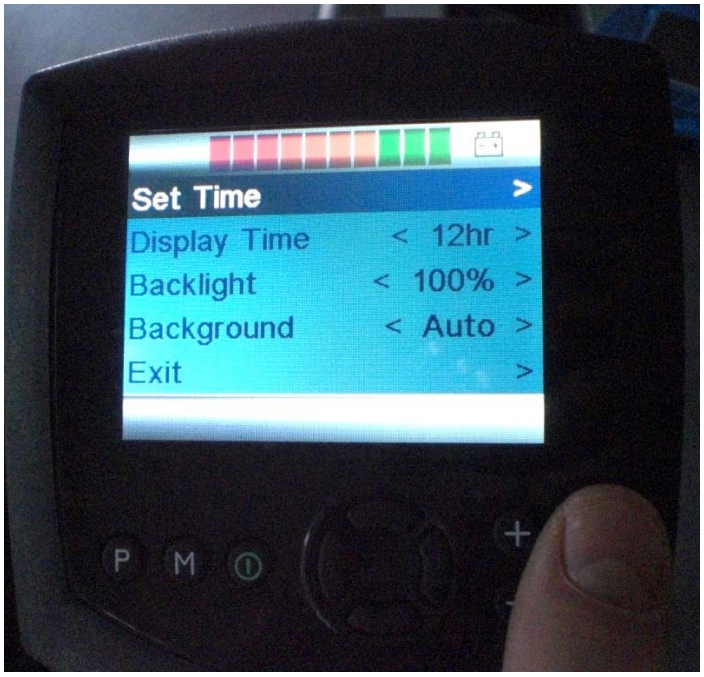
ON/ Off Button – This button provides a complete Power Down of control system electronics. In addition to the button mounted there is a facility on the inputs for an optional, externally mounted switch that can be operated by the user for on/off usage.

Mode Button – The mode button allows for the user to change between available programmed Modes.

Profile Button – The profile button allows for user to change between available programmed Profiles or Drives.

Navigation Buttons – The array of 4 buttons allow Dealer to navigate between OBP screens.

+ / - Buttons – These buttons allow change of Speed as a Speed Potentiometer would do. They also allow adjustments while in OBP parameters.
Holding both of these buttons down at same time launches the Omni into Settings menu screen as seen below

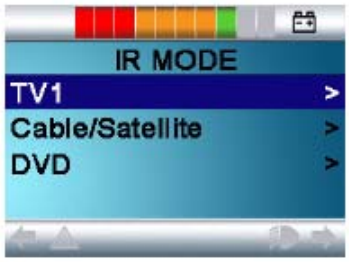


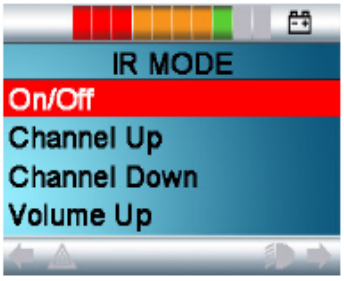
This allows Setting of Time – using the 4 array buttons
Allows setting of time in 12 hr or 24 hr or Off if not wanted
Allows change of Backlight – Auto – Blue – White (Auto and Blue = same)
Allows change of Background light from 10% to 100% (= Auto)

In addition is that IR has been available since May 2009 below are details:

The Omni includes and IR Transmitter and receiver that allows the Omni to replicate commonly used IR devices, such as remote controls for TV's, DVD's, Cable/Satellite or environmental controls such as automatic door openers.

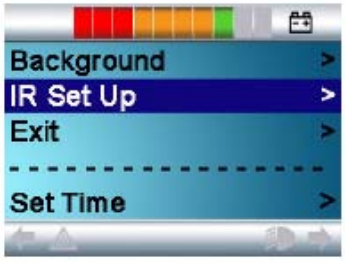
IR Appliances Listing





When unit is transmitting selected command will show up Red in the listing

Omni with IR Setup and Code Save



Accessing the IR Setup

IR Setup Menu

If command checked it is setup

Omni with IR (continued)

Select learn code by using right button while command is highlighted

Point the items Channel Up at the Omni Receiver and press twice

A check denotes a successful operation and an X denotes unsuccessful.

Enabling and Disabling IR Codes

To Enable a Code use the + sign on the front pad and a Check will appear
To Disable a Code use the - sign on the front pad and an X will appear

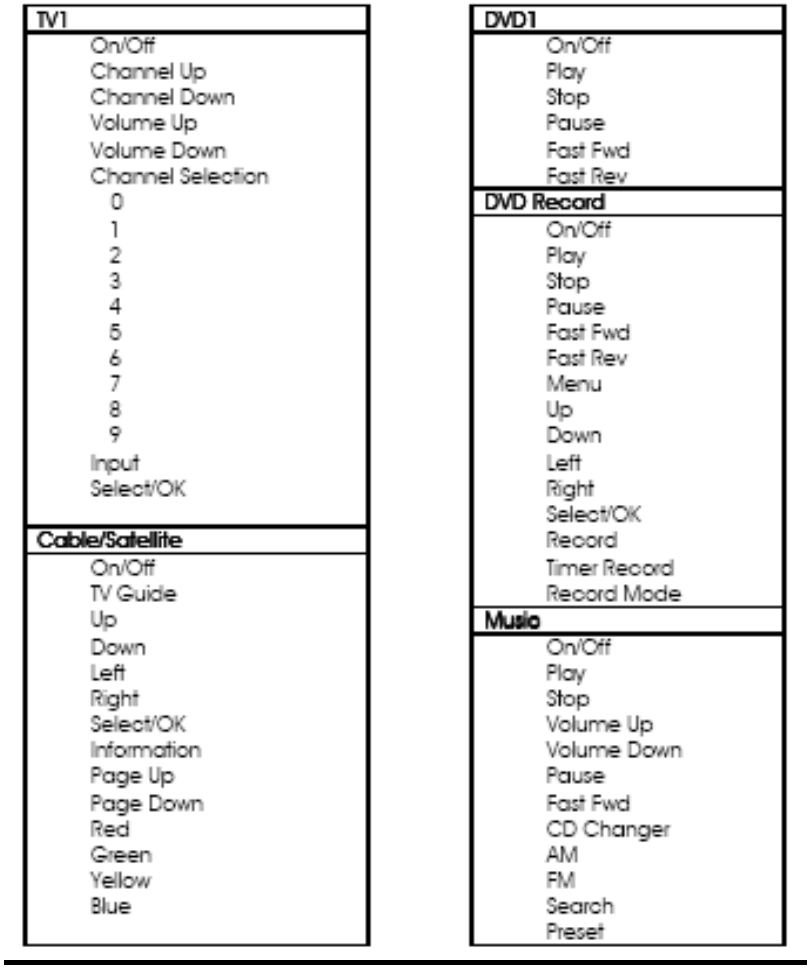
Deleting Codes

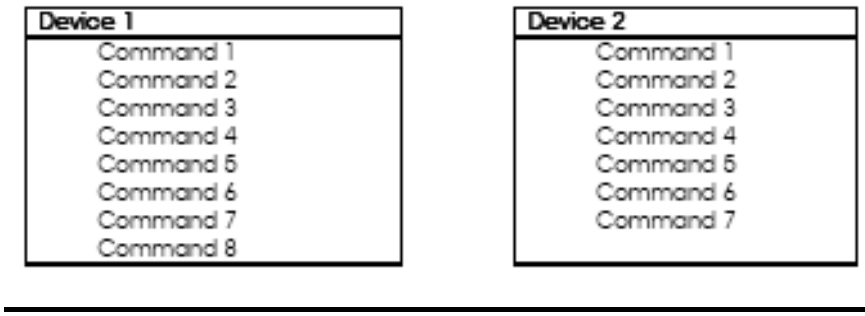
To Delete a Code highlight the specific command and then press right button

To Delete a Code pick from Submenu and it will delete all codes

Note: It must be have power recycled to delete all codes

Omni IR Default Menu

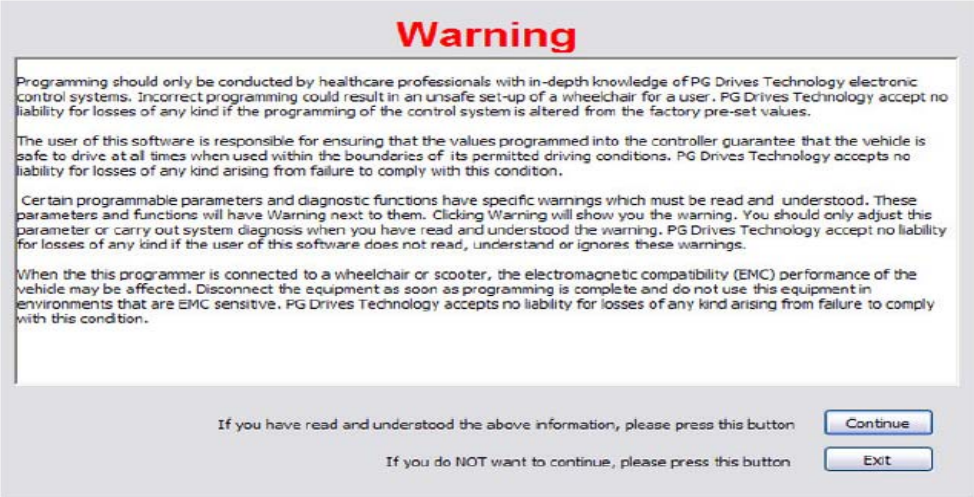




IR Configuration Tool

The IR configuration tool is a PC based application that allows the user to

- Read and Write IR menus from and to an R-net Control System
- Create IR menus.
- Change IR menus.
- Save IR menus.

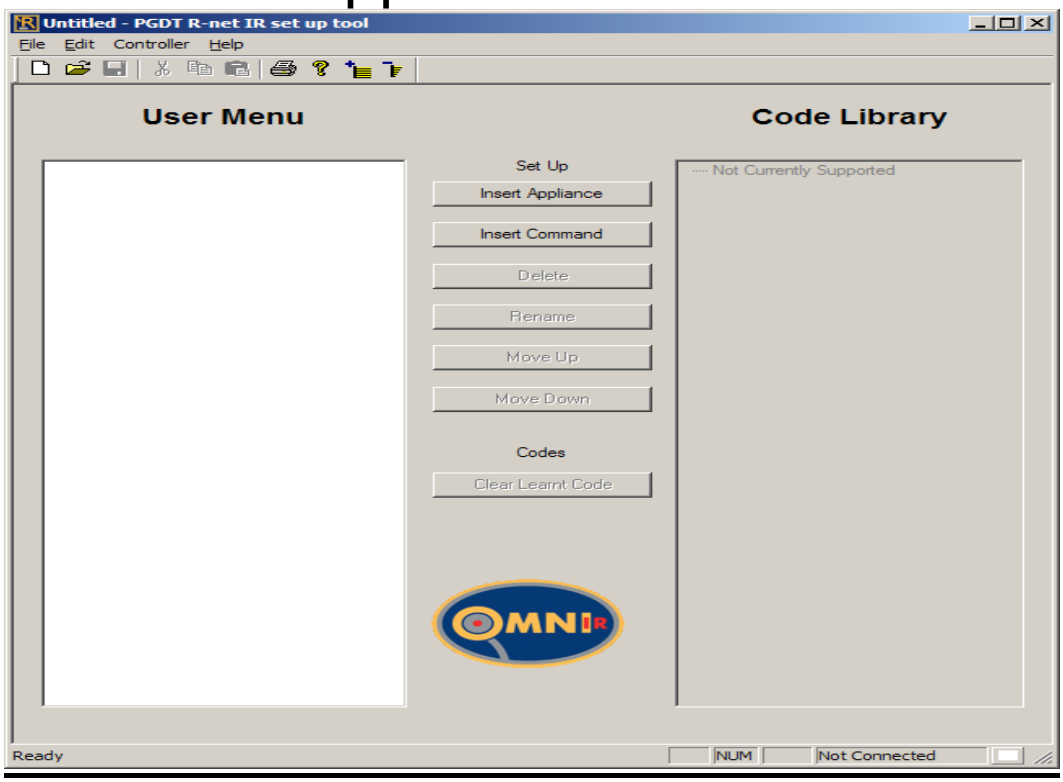

Warning
Programming should only be conducted by healthcare professionals with in-depth knowledge of PG Drives Technology electronic control systems. Incorrect programming could result in an unsafe set-up of a wheelchair for a user. PG Drives Technology accept no liability for losses of any kind if the programming of the control system is altered from the factory pre-set values.
The user of this software is responsible for ensuring that the values programmed into the controller guarantee that the vehicle is safe to drive at all times when used within the boundaries of its permitted driving conditions. PG Drives Technology accepts no liability for losses of any kind arising from failure to comply with this conditon.
Certain programmable parameters and diagnostic functions have specific warnings which must be read and understood. These parameters and functions will have Warning next to them. Clicking Warning will show you the warning. You should only adjust this parameter or carry out system diagnosis when you have read and understood the warning. PG Drives Technology accept no liability for losses of any kind if the user of this software does not read, understand or ignores these warnings.
When the this programmer is connected to a wheelchair or scooter, the electromagnetic compatibility (EMC) performance of the vehicle may be affected. Disconnect the equipment as soon as programming is complete and do not use this equipment in environments that are EMC sensitive. PG Drives Technology accepts no liability for losses of any kind arising from failure to comply with this condition.
If you have read and understood the above information, please press this button
Continue
If you do NOT want to continue, please press this button
Exit

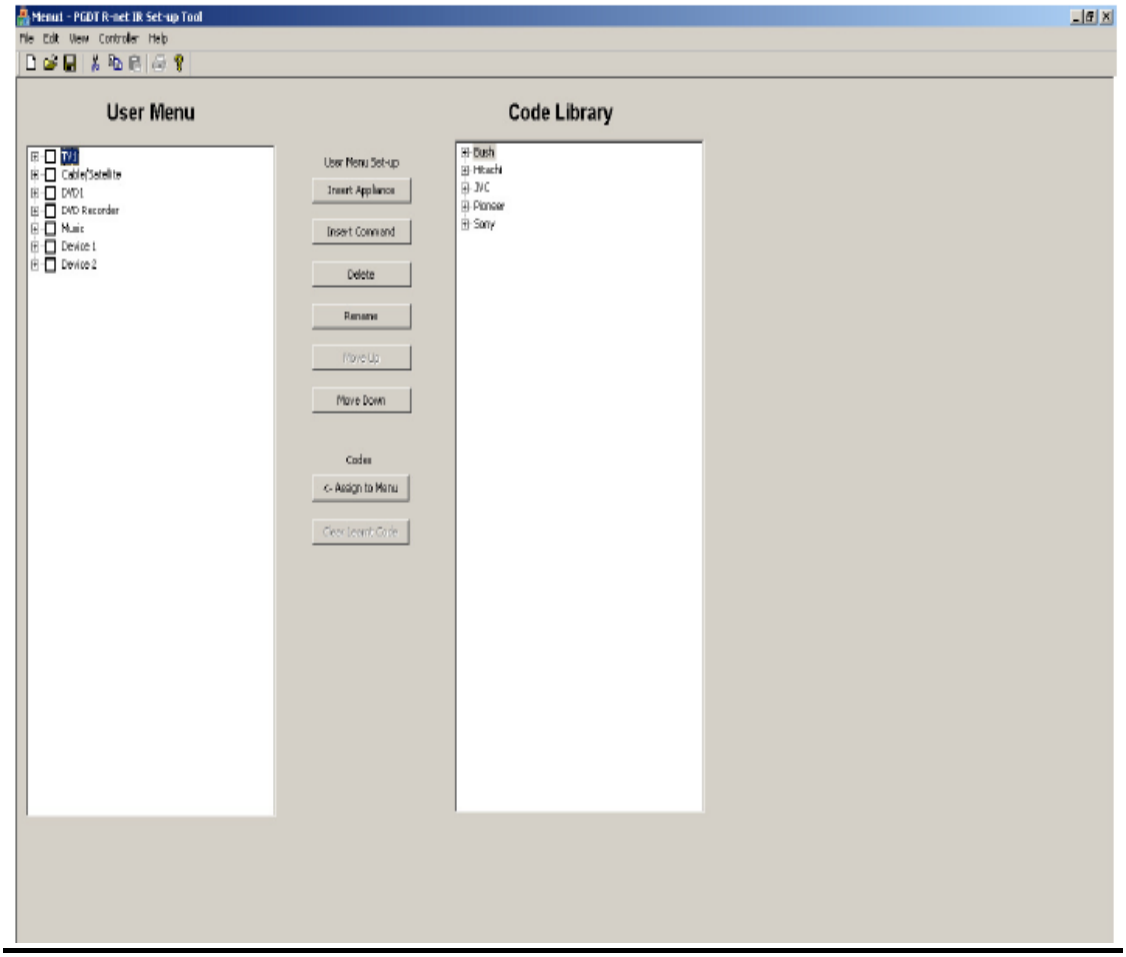
Clicking Continue opens the IR Configurator Window.

To begin using the IR Configurator one of three things must occur:

- A new file must be opened.
- An existing file must be opened.
- A file must be read from the Control System.

Application Window




Menu1 - PGDT R-net IR Set-up Tool
File Edit View Controller Help
User Menu
Code Library
TV1
Cable/Satellite
DVD1
DVD Recorder
Music
Device 1
Device 2
User Menu Set-up
Insert Appliance
Insert Command
Delete
Rename
Move Up
Move Down
Codes
<- Assign to Menu
Clear Learnt Code
Bush
Hitachi
JVC
Pioneer
Sony

Omni Installation

The Omni can be used with many different types of SID's and then in various modes of operation, driving, latched driving, seat adjustment etc. The Omni Must be configured to meet individual requirements of the user. Below is a suggested installation and set-up sequence:

1. Assess user's needs and select relevant SID.
2. Install the Omni onto the powerchair.
3. Install the SID onto the powerchair.
4. Program the Omni to match the SID.
5. Program the Omni to suit the user.
6. Program the R-Net driving characteristics to suit the user.

When installing SID onto chair if usage is for only operation one device it is recommended to connect to Port and make sure all connections are tight – route and secure all cables and tubes in such away as to prevent damage by crushing, cutting or snagging.
User Switch is recommended for safety and ease of use for customer – it is recommended to set to Normally Open. If switch is disconnected as additional safety a warning of User Switch disconnect will come up on screen – preventing drive of chair. In programming of Switch Detect we also have a setting of Limp which allows slow driving with a visual of Limp on screen. The option of off is there as well but not recommended.

OBP – (On-Board Programming) -Through the OMNI

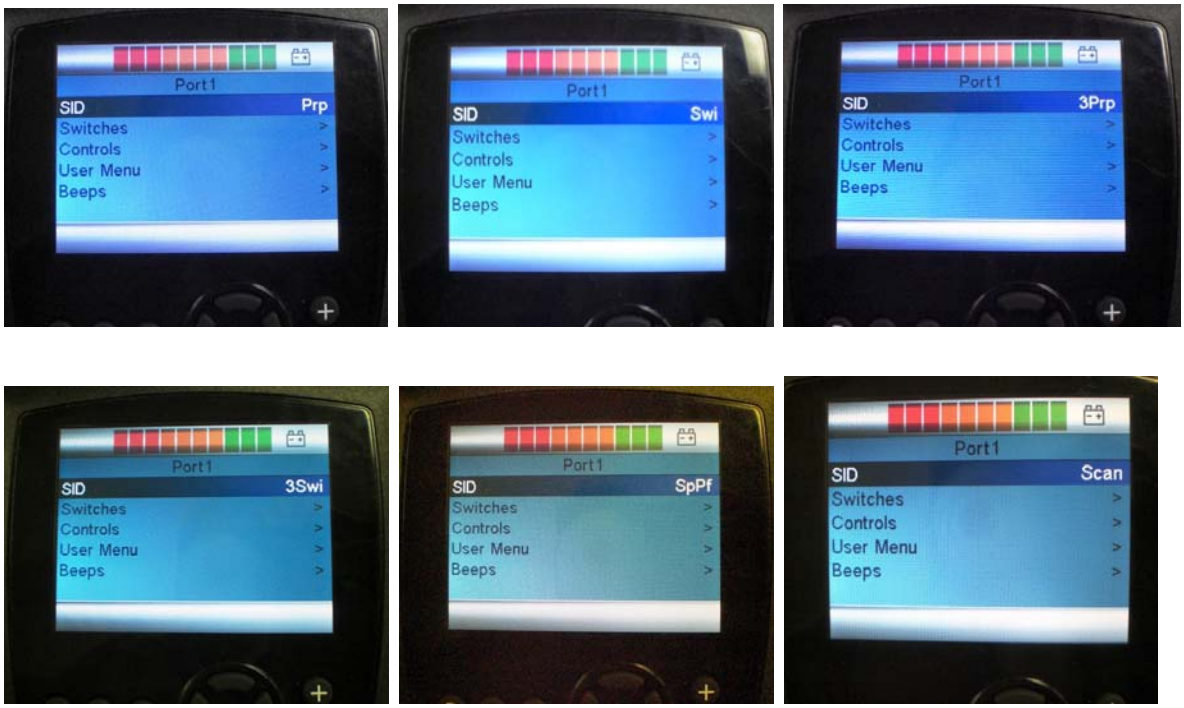
This is performed using the Omni's own display and front panel buttons. From the Omni, all system OBP parameters can be adjusted: for example, Speeds and Accelerations.
To enter into this mode the R-Net Dongle is required as described in Programming section – for connections – after connected turn on control system and using the mode button to step to OBP mode. It is very important as the dealer to make sure Mode 8 is never turned off for that is what allows access to OBP mode.
Note: While the Dongle remains attached, the mode button can be used to access all system modes and to return back to OBP mode.
The other 2 options of programming will be through the Hand Held known as DTT or PC Programming via software and Cable.

Program the Omni to Match SID

The Omni is compatible with Six Types of SID

1. **Joystick**
2. **Five Switch**
3. **Three Axis Proportional**
4. **Three Axis Switch**
5. **Sip & Puff and User Switch**
6. **Single switch scanner**

This can all be found when programming under the heading of SID



The 6 types are shown above how they are displayed under Port 1 or Port 2.

Diagnostic Section

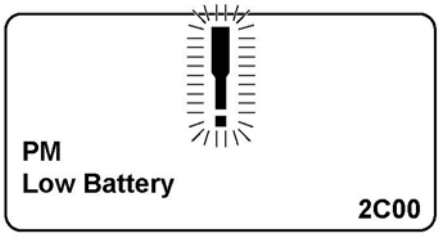
Intro: The Diagnostic Section has all details of the complete system – it is as a guide to help the Technician find a quicker way of diagnosing and finding the solution accurately and efficiently.

Diagnostic Procedure

Please follow this procedure:

- Read and note the Trip Text displayed, the identified Module and the Trip Code.
- Switch off the control system.
- Make sure that all connectors on the listed Module and the wheelchair are mated securely.
- Check the condition of the battery.
- Find the definition of the Trip Code in this Service Guide, and take the required action.
- Switch on the control system again and try to drive the wheelchair. If the safety circuits operate again, switch off and do not try to use the wheelchair. Contact Sunrise Technical Service.

Example:



Identified Module	**Power Module Trip.**
Trip Text	Low Battery
Trip Code	2C00

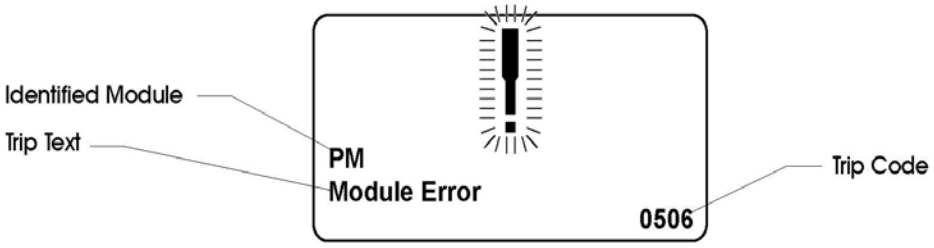
This means the battery needs charging or there is a bad connection to the battery.

- Check the connections to the battery. If the connections are good, try charging the battery.

Diagnostic Screen

When the control system safety circuits have operated and the control system has been prevented from moving the wheelchair a diagnostics screen will be displayed.

This indicates a system trip, i.e. the R-net has detected a problem somewhere in the wheelchair's electrical system.



If the error is in a non-active module, for example in the ISM but with a drive Profile is selected, then drive will still be possible, however, the diagnostic screen will appear intermittently.

Identified Module

This identifies which module of the control system has registered the problem.

PM Power Module

JSM Joystick Module

ISM Intelligent Seating/lighting Module

Trip Text

The Trip Text gives a brief description of the trip type

Trip Code

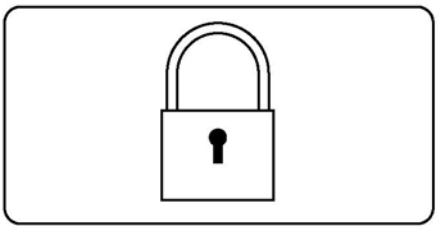
The 4 digit code displayed gives the exact trip that has been recorded.

Keypad Locking

To lock the wheelchair using the keypad;

- While the control system is switched on, depress and hold the On/off button.
- After 1 second the control system will beep. Now release the On/off button
- Deflect the joystick forwards until the control system beeps.
- Deflect the joystick in reverse until the control system beeps.
- Release the joystick, there will be a long beep.
- The wheelchair is now locked.

The following screen will be displayed.



If an LED Joystick Module is use (EL) the Speed Indicator LED's will ripple from left to right

To unlock the wheelchair;

- If the control system has switched off, press the On/off button.
- Deflect the joystick forwards until the control system beeps.
- Deflect the joystick in reverse until the control system beeps.
- Release the joystick, there will be a long beep.

The wheelchair is now unlocked and ready for use

Key Locking

To lock the wheelchair with a key;

- Insert and remove a key into the Charger Socket on the Joystick Module.
- The wheelchair is now locked.

Picture of Keylock

The following screen will be displayed

To unlock the wheelchair;

- If the control system has switched off, press the On/off button.
- Insert and remove a key into the Charger Socket.

The wheelchair is now unlocked

Diagnostic Listing

1 Bar	The battery needs charging or there is a bad connection to the battery. Check the connections to the battery. If the connections are good, try charging the battery.
2 Bar	The left hand motor* has a bad connection. Check the connections to the left hand motor.
3 Bar	The left hand motor* has a short circuit to a battery connection. Contact your service agent.
4 Bar	The right hand motor* has a bad connection. Check the connections to the right hand motor.
5 Bar	The right hand motor* has a short circuit to a battery connection. Contact your service agent.
6 Bar	The wheelchair is being prevented from driving by an external signal. The exact cause will depend on the type of wheelchair you have, one possibility is the battery charger is connected.
7 Bar	A joystick fault is indicated. Make sure that the joystick is in the center position before switching on the control system
8 Bar	A control system fault is indicated. Make sure that all connections are secure.
9 Bar	The parking brakes have a bad connection. Check the parking brake and motor connections. Make sure the control system connections are secure.
10 Bar	An excessive voltage has been applied to the control system. This is usually caused by a poor battery connection. Check the battery connections.
7 Bar + S	A communication fault is indicated. Make sure that joystick cable is securely connected and not damaged.
Actuator Flash	An Actuator trip is indicated. If more than one actuator is fitted, check which actuator is not working correctly. Check the actuator wiring.

*Note: * If the programmable parameter, Motor Swap has been enabled, then left and right hand references in this table will need transposing.*

Note: This will be referenced for the EL LED joystick only.

1 Bar ●	The battery needs charging or there is a bad connection to the battery. Check the connections to the battery. If the connections are good, try charging the battery.

Troubleshooting Batteries

1. Check for good voltage at Module input charger port. Should read between 23.5 and 25.8 volts for proper operation. Less than 23.5 volts will give a low battery Indicator (2 Bar flash).
2. If no voltage at port go to cable that inputs voltage to Control found on battery box connector shown earlier. Once again verify voltage and check for popped circuit Breaker. Reset Circuit breaker.
3. If still no power go directly to individual batteries across + and – posts to see at least 12.2 to 13 volts (fully charged).
4. The 3 tests above will verify voltage in what is known as an unloaded state. The next test is to insure batteries last under load. This can be done a number of ways. 2 ways of checking are listed below:
   a) The load test across the + and – terminals of battery - make sure battery is in full charged state. Hook up load tester and draw 100 amp load across for 10 seconds.
   b) The chair has a free wheel release where the motor and gearbox can be run un-loaded – this still draws 3 -4 amps across the load. Hold joystick or input device for 1 minute If after release in a minutes time it drops more than a volt Change batteries – if it drops between .6 and 1 volt it has a Cell that is weak and batteries will no stay fully charged It is recommended to change batteries. If the voltage after a minutes time drop less that .1 volt but not greater than 0.5 volts the batteries are in good shape.

Code 2C00 – indicates Low Battery - 1 Bar Flashing

2 Bar	The left hand motor* has a bad connection. Check the connections to the left hand motor.
3 Bar	The left hand motor* has a short circuit to a battery connection. Contact your service agent.
4 Bar	The right hand motor* has a bad connection. Check the connections to the right hand motor.
5 Bar	The right hand motor* has a short circuit to a battery connection. Contact your service agent.
9 Bar	The parking brakes have a bad connection. Check the parking brake and motor connections. Make sure the control system connections are secure.

Motor Troubleshooting

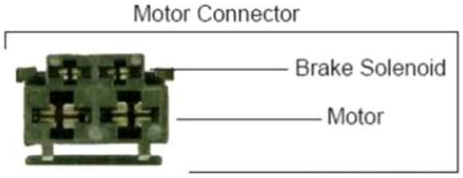
3B00 – for the M1 connection open – control does not see proper connection or resistance to **Motor 1**. Left Code for rear wheel drive units and right code(3C00) for Mid- wheel drive. *(This is in reference to the Motor mounted on the left)*

3C00 – for the M2 connection open – control does not see proper connection or resistance to **Motor 2**. Right Code for rear wheel drive units and left code(3B00) for Mid- wheel drive. *(This is in reference to the Motor mounted on the right)*

1505- for the Right Brake open – control does not see good Brake resistance – two cases: normally open – close to 0 ohms or shorted - ultra high resistance.

1507 - for the Left Brake open – control does not see good Brake resistance – two cases: normally open – close to 0 ohms or shorted - ultra high resistance.

The Proper Reading is shown below:



15 – 16 ohms
0 – 2 ohms

Diagnostic Text Description

Trip Text
1 Joystick Error
2 Low Battery
3 High Battery
4 M1 Brake Error
5 M2 Brake Error
6 M1 Motor Error
7 M2 Motor Error
8 Inhibit Active
9 Joystick Cal Error
10 Latched Timeout
11 Over-current
12 Overtemp. (Acts)
13 Bad Settings
14 DIME Error
15 Memory Error
16 PM Memory Error
17 Bad Cable
18 Module Error
19 System Error - 8100 Code
20 SID Detached
21 Overtemp. (Lamps)
22 R Ind Lamp Short
23 L Ind Lamp Failed
24 R Ind Lamp Failed
25 Right Lamp Short
26 Brake Lamp Short
27 Left Lamp Short
28 L Ind Lamp Short
29 User Switch Detached
30 Gone to Sleep
31 Charging

1 Joystick Error

The most common cause of this trip is if the joystick is deflected away from center before and during the time the control system is switched on. The joystick displaced screen will be displayed for 5 seconds, if the joystick is not released within that time then a trip is registered. Although a trip screen is not displayed the system log will show the trip and numbers of occurrences.

- Ensure that the joystick is centered and power-up the control system.

If the trip is still present then the joystick or Joystick Module may be defective.

2 Low Battery

This occurs when the control system detects that the battery voltage has fallen below 16V.

- Check the condition of the batteries and the connections to the control system.

If the trip is still present after the batteries and connections have been checked, then the Power Module may be defective.

3 High Battery Voltage

This occurs when the control system detects that the battery voltage has risen above 35V. The most common reasons for this are overcharging of the battery or bad connections between the control system and the batteries.

- Check the condition of the batteries and the connections to the control system.

If the trip is still present after the batteries and connections have been checked, then the Power Module may be defective.

4 & 5 Brake Error

This occurs when the control system detects a problem in the solenoid brakes or the connections to them.

1505 - M1 Brake Error

1506 - M2 Brake Error

- Check the solenoid brakes, cables and connections to the control system.

If the trip is still present after the above checks have been made, then the Power Module may be defective

6 & 7 Motor Error

This occurs when the control system detects that a motor has become disconnected.

3B00 - M1 Motor Error - Refer to section 2.3 for connection details

3C00 - M2 Motor Error - Refer to section 2.3 for connection details

- Check the motors, cables and connections to the control system.

If the trip is still present after the above checks have been made, then the Power Module may be defective.

8 Inhibit Active

This occurs when any of the Inhibit inputs are active and in a latched state.

The actual inhibit that is active is indicated by the last 2 digits in the Trip Code. The code is in Hex.

1E01 - For Inhibit 1

1E09 - For Inhibit 9

1E0A - For Inhibit 10

- Cycle the power. This will drop out of Latched Mode that might clear the trip.
- Check all wiring and switches connected to the indicated Inhibits.

If the trip is still present after the above checks have been made, then the ISM may be defective.

9 Joystick Calibration Error

This occurs when the Joystick Calibration process has not been successful.

- Enter OBP and attempt calibration.

If the trip is still present after the above has been attempted, then the Joystick Module may be defective. The internal Joystick Gimble may be faulty and part can be replaced.

10 Latched Timeout

This occurs when the control system detects that the Latched Timeout programmed time has been exceeded. For example, the Input Device (Joystick, Head Array, Sip and Puff, etc.) has not been operated frequently enough.

The trip is a notification of why the control system has dropped out of Latched Mode.

- Cycle the power.
- Initiate Latched Mode.

If the trip is still present after the above checks have been made, then the Input Device may be defective.

11 Over-current

This occurs when the control system detects an excessive amount of current in an Actuator Channel.

This may be due to a faulty end stop switch, actuator motor, cables or connections.

- Check the movement of the actuator is not obstructed.
- Check the end stop switches (if fitted) are terminating the power to the actuator motor.

If the trip is still present after the above checks have been made, then the ISM may be defective.

12 Overtemp (acts)

This occurs when the control system detects that the ISM's actuator circuitry has become too hot. The control system will cease drive to the actuator motor in question.

- Allow the ISM to cool.

- If the ISM is frequently overheating check the condition of the actuator motors and the connections to them. If the trip persists contact your service agent.

13 Bad Settings

This occurs when the control system detects incorrect or invalid program settings.

- Check all parameter settings and re-program the control system using the R-net PC Programmer.
- Make a note of the current parameter settings and then reset the control system to default settings.
- Re-program the required settings in small groups, cycling the power after each group to see if the trip occurs.

If the trip is still present after the above checks have been made, then the PM may be defective.

14 DIME Error

This occurs when the control system detects an identification conflict between two modules in the system.

If a new module has been introduced:

- Disconnect the new module and cycle the power.
- If no trip is present connect the new module to the system and cycle the power.
- If the trip reappears then the new module must be the cause of the problem.

If there has been no additions:

- Disconnect one module at a time and cycle the power.

If the trip is still present after the above checks have been made, contact your service agent.

15 Memory Error

This is a non-specific memory error that could be caused by any of the modules within the system.

- Check all cables and connections.
- Cycle the power.

If the trip is still present and the system contains 3rd party Modules:

- Disconnect all the non-PGDT modules and cycle the power.

If this has cleared the trip:

- Connect each 3rd party module in turn, cycling the power each time.
- If the trip reappears after one of the power cycles then the last module to have been added to the system must be defective.

If the trip is still present after the above checks have been made, then the PM may be defective.

16 PM Memory Error

This is a specific Power Module based trip.

- Check all cables and connections.
- Using the R-net PC Programmer, re-program the control system.

This should be done with either the most current specific program file for the wheelchair or the manufacturers original programming file. If the trip is still present after the above checks have been made, then the PM may be defective

17 Bad Cable

This occurs when the control system detects a fault in the wiring in the communication cables between any of the modules.

- Check all cables and connections for continuity.
- If there is any visible damage to cables, replace and cycle power.
- Disconnect one cable from the system at a time cycling the power after each disconnection.

If the trip is still present after the above checks have been made, then the PM may be defective.

18 Module Error

This occurs when the control system detects a trip within a specific module. The module will be identified on the diagnostics screen as described in section 2.

- Check all cables and connections.
- Cycle the power.

If the trip is still present after the above checks have been made, then the module identified may be defective.

19 System Error

This occurs when the system detects a trip that cannot be attributed to a specific module.

- Check all cables and connections.
- Cycle the power.

If the trip is still present and the system contains 3rd party Modules:

- Disconnect all the none-PGDT modules and cycle the power.

If this has cleared the trip:

- Connect each 3rd party module in turn, cycling the power each time.
- If the trip reappears after one of the power cycles then the last module to have been added to the system must be defective.

If the trip is still present after the above checks have been made, then the PGDT control system may be defective.

20 SID Disconnected

The Omni has detected that the Specialty Input Device (SID) has become disconnected.

- Check all cables and connectors between the Omni and the SID.

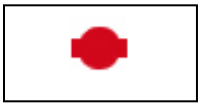
If the error persists:

- Check that the setting of the parameter, 9-Way Detect, is appropriate for the SID that is being used. For example, if the SID has no detect-link, then this parameter should be set to Off.

If the trip is still present after the above checks have been made, then the Input Device may be defective. Contact your service agent.

No Codes or Text - will be displayed

Motor Temperature

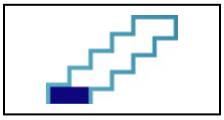


This symbol is displayed when the control system has intentionally reduced the power to the motors, in order to protect them against heat damage.

Control System Temperature

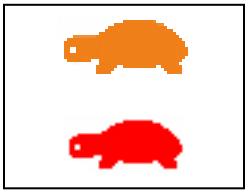
This symbol is displayed when the control system has intentionally reduced its own power, in order to protect itself against heat damage.

Latched



When the control system is operating in a Latched Condition this will be displayed

Inhibit



If the speed of the chair is being limited, example Tilt then the speed will be reduced and this symbol will be show

If the wheelchair is inhibited from driving then this symbol will be shown

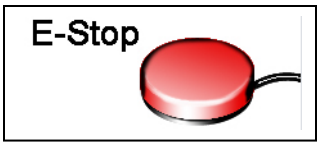
Restart or Reboot

When a control systems requires a reboot, for instance when a new module is added and reconfiguration is done. This symbol is flashed.

Sleep

This symbol is shown when R-Net has gone into sleep mode

E-Stop



If the user switch is activated during drive or actuator operation this emergency stop will be activated. This will also appear if Latch is selected prior to operating chair switch needs to be engaged.

Joystick Displaced

If you operate the joystick before or just when you switch on the power the Joystick displaced screen will appear.
You must release and then resume normal operation once screen disappears. If you hold for more than 5 seconds you will have to reset power to unit – for a diagnostic will be displayed across screen. Reset power will regain normal operation.

Note: If you have a bad joystick gimble this will occur and not reset – with LED or EL joystick you will see 7 Bars flashing.

8 Bar Flash

A Code which indicates Module failure – could be connections bad programming etc.

Section 10 – Acronyms

JSM - Joystick Module

ISM - Intelligent Seating Module

PM - Power Module

Dongle - Programming Device On board or Computer Programming

SID - Specialty Input Device

OBP - On board programming

DTT - Diagnostic Test Tool

IOM - Input Output Module

EL - Entry Level

LED – Light Emitting Diode